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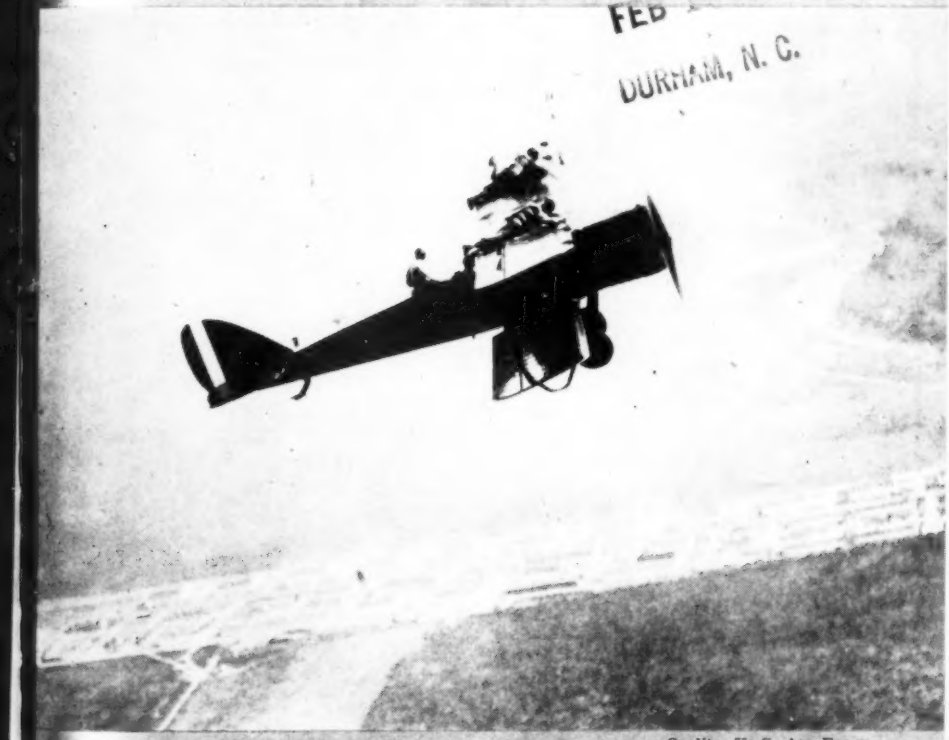

Credit.: U. S. Air Force

A method of testing back type parachutes from the wings of a DH-4 airplane, at McCook Field in the early 1920's.

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THE AIR FORCE HISTORICAL FOUNDATION

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The business and objectives of the Foundation are educational and literary; to preserve the annals of American air power, especially the annals of the United States Air Force, its components, subsidiaries and affiliates, and of the individuals of whom they are composed; to disseminate to the public and to posterity accurate and complete historical information on air power subjects; and to preserve in a central repository significant materials depicting the history, culture, and traditions of the United States Air Force and the organizations which preceded it.

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THE AIR POWER HISTORIAN

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CONTENTS

3 KNOWLEDGE . . . THE WINGS, Air Force Institute of Technology
by Brigadier General Cecil E. Combs, USAF

10 THE GENESIS OF NAZI LUFTPOLITIK, 1933-1935
by Dr. Eugene M. Emme

24 AIR TECHNOLOGY AS A FOUNDLING
by Colonel Edwin E. Aldrin, USAF (Ret)

28 IMPACT OF WEAPONS TECHNOLOGY ON AIR WARFARE, 1941 - 1945
by Colonel John J. Driscoll, USAF

39 SQUADRON OFFICER SCHOOL
by Colonel Robert J. Loughry, USAF

51 WHAT USE IS HISTORY?
A Concept from The Royal Bank of Canada

57 THE FEDERAL HISTORIAN — VITAL, BUT SELDOM UNDERSTOOD
by William R. Stevenson and Robert A. Smith, III

61 AIRMAN'S BIBLIOGRAPHY
Book Reviews
Recent Books
Recent Articles

69 NEWS ITEMS

72 LETTERS TO EDITOR

It is the policy of *The Air Power Historian* neither to endorse nor subscribe to the views expressed in the articles it presents. Many events in history must perforce remain controversial by reason of the multiplicity of interpretations given these events by those who participated in them, or have studied them from hindsight. Appropriate articles are invited for consideration.

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Credit.: U. S. Air Force

Site of the Institute of Technology as it appeared in June, 1928. This picture of Wright Field shows the unpaved roads, utilities and buildings of the site as it appeared at the time of the Institute's establishment.

Credit: U. S. Air Force

Site of the Institute of Technology as it appeared in June, 1928. This picture of Wright Field shows the early development of public works building program of the government.

KNOWLEDGE . . . THE WINGS
AIR FORCE INSTITUTE OF TECHNOLOGY

By BRIGADIER GENERAL CECIL E. COMBS

In these critical times when a superior technology may prove to be the decisive factor in any major military action, the editors take pleasure in presenting to our readers the story of the Air Force program to further healthy growth in this rapidly expanding field of endeavor. To lag in this demanding program would be a direct invitation to disaster.

The author of the following article, presently Commandant of the Air Force Institute of Technology, comes to the pages of The Air Power Historian, *highly qualified to treat with this important subject which is demanding the ever-increasing interest and attention of the nation. A native of Texas, Brigadier General Cecil E. Combs is a graduate of the U. S. Military Academy. When World War II started he was in command of the 93rd Bomb Squadron in the Philippines. Later, in Java, he commanded the 19th Bomb Group, and then the Seventh in India. After a brief assignment as assistant operations officer for the Ninth Air Force in Egypt, he returned to India in 1943 as Deputy Commander, and subsequently, as Commander of the India Task Force. He did a short tour in the States as Deputy Chief of Staff/Operations, Twentieth Air Force, and then again went overseas to the Mariannas as Deputy Commander of the 59th Bomb Wing. Since the War he has served several assignments in staff functions in Washington, D. C., and has held command of several units in SAC and ATC. He possesses the Silver Star, Distinguished Flying Cross with two Oak Leaf Clusters, the Legion of Merit, and the Air Medal with one Oak Leaf Cluster. General Combs became Commandant of the Air Force Institute of Technology in September, 1957.*

In the historical development of the Air Force Institute of Technology from rather tentative and experimental beginnings down to its present educational operations, certain patterns and trends may be identified. An examination of this evolution unmistakably suggests sharp analogy with both the broader development of technology in the Air Force and the concomitant growth of technological education in the United States. As aeronautical and, ultimately, astronautical sciences have emerged as primary instruments of national survival, problems of technology have been constantly aggravated and educational needs immeasurably enlarged. The growth of the Institute is a specific response to this new and persistent historical challenge—just as its origin was a response to the earlier and perhaps simpler

challenge of the elementary applications of military airpower. Exactly as the beginnings of the Institute were the successful adjustment of military philosophy to scientific progress, the continuity of the Institute is an uninterrupted pattern of the integration of new science with military necessity.

When Shakespeare called knowledge "the wings wherewith we fly to heaven," his poetic truth anticipated a literal truth which is becoming perceptible and which is only beginning to reveal its possible meanings. As man's unquenchable will to comprehend his environment lifts his technologies beyond his planet, what is known becomes freshly applicable and what is unknown becomes always potentially attainable.

Although the work of the Air Force Institute of Technology has been geared to the fulfillment of precise Air Force needs, its effects, and indeed its methods, deserve consideration as part of our national educational effort. The Institute has gradually and progressively identified the educational programs that are necessary to the maintenance of present and future airpower and, in establishing and refining these programs, it has exploited a growing opportunity to contribute to our philosophy of education and to enhance our national educational strength. Briefly, what began as the solution of rather restricted educational problems has inevitably resulted in an institute of broad applications and potentialities.

Complex But Unified Whole

The history of the Institute is one of identification of needs, fulfillment of those needs, assimilation of new developments, and delineation of educational techniques. The grouping of educational programs in the Institute represents a complex but unified whole which brings together Air Force activities in higher education and relates those activities to technological progress. The components of this whole are the School of Engineering, the School of Business, the School of Logistics, the School of Installations Engineering, and a great number of programs in civilian colleges and universities. Through the interactions among its resident programs and its contract programs, and through its close coordination with other Air Force commands, the Institute is an important channel for the exchange of ideas and research between the Air Force and the rest of the scientific and academic world.

The Institute was founded because Air Force officers needed education in subjects related directly to Air Force technical problems, and that particular education was not then available in civilian institutions. As the Institute developed and as technological education progressed nationally, the need for broad and varied resources was clarified, and the importance of both resident and contract curricula increased. Moreover, the technological needs of the Air Force became more inseparable from the educational and research patterns of civilian universities. As a result, there has been, under the supervision of the Institute, more or less parallel development of both programs. At present, over 2500 of the 3000 Institute students work in civilian institutions. The cooperation of civilian institutions has made it possible to carry out a truly comprehensive educational effort without undue expansion of the resident program. It also permits the tailoring of resident programs to Air Force needs in a way that encompasses the best of civilian educational principles but does not duplicate available civilian resources.

Technological education, in the Armed Services of the United States, as a means toward the development and maintenance of airpower was probably begun in 1914, when Captain Virginius E. Clark was detailed to the Massachusetts Institute of Technology to study aeronautical engineering. This single personnel action has no casual significance, but is of historic interest in dating a formal recognition of this need.

Early Schools of Technology

During World War I, an Army and Navy School of Aeronautical Engineering was established at MIT and two emergency classes were graduated. In 1919, Colonel Thurman H. Bane, who commanded McCook Field at Dayton, proposed the formation of the Air School of Application within the Engineering Division of the Air Service. After this proposal was approved by the War Department, Colonel Bane became Commandant of this school and patterned its organization on the Ordnance School of Application at Sandy Hook, New Jersey. A class of seven officers entered training at Dayton in November, 1919. In 1920, legislation by Congress created the Air Service, and the name of the school was changed to the Air Service Engineering School. The organization which was to become the Air Force Institute of Technology was in existance.

A useful pattern of combining education and application was established early in the Air Service Engineering School. To small and rather informal classes, specialists of the Engineering Division of McCook Field presented instruction and applications in a one-year curriculum. The facilities of the Engineering Division were used as laboratories and research centers for instruction. Although specialized, the level of instruction was identified as comparable to civilian graduate study. Thus, the important tradition of the interdependence between education and research-in-progress was established.

The basic prerequisite for students who entered the Air Service Engineering School was a strong background in the fundamental engineering sciences, whether derived from formal education or extensive practical experience. The curriculum evolved for these students included: mechanics, strength of materials, shop work, business administration, armament, electricity, thermodynamics, engine design, theory of flight, and airplane design. Strong emphasis was placed on applications, and the courses were taught consecutively rather than concurrently. Core subjects, therefore, were identified relatively early in the development toward the Institute.

In 1926, Congress authorized the creation of the Air Corps and at the same time directed a five-year program of air development. In the following year, Wright Field was activated on a 4500-acre tract of land donated to the government by the citizens of Dayton. As the Air Service Engineering School was re-established as the Air Corps Engineering School,—its educational philosophy and policies were adjusted to growing needs for scientific capability and to increasingly specialized knowledge in the development of airpower. Curriculum offerings and emphasis on basic science were increased, and the purposes of the curriculum were enlarged to prepare young officers to perform basic work in research and design. Steps were taken to assemble a permanent faculty. Instruction in theoretical science was increased so that a greater and therefore more economical variety of applications could be realized.

These were the patterns and trends of development in the School until the exigencies of World War II suspended its operations in December, 1941. Among the select 394 officers who attended the school up to this time were such outstanding Air Force leaders as Generals Kenney, Doolittle, Fairchild, Cook, Frank, Whitehead, Chidlaw, Wolfe, Echols, Harmon, and many others. Fortunately, many of these graduates are still serving the cause of our strength in the air—Irvine, Wilson, Swofford, Schriever,—to cite just a few.

In August 1945, when the end of World War II was imminent, Major General H. J. Knerr, Commander of the Air Technical Service Command, proposed that the Engineering School be expanded into a technological institute which would qualify 200 officers yearly in engineering, logistics, maintenance, and procurement. This far-sighted proposal, expanded to delineate curricula in aeronautical engineering and related subjects, was the blueprint for the creation of the Institute proper.

First Official Institute of Technology

After a proposed regulation was submitted to Headquarters, Army Air Forces, in August 1945, Major General B. W. Chidlaw, Deputy Commanding General for Engineering, and Brigadier General L. C. Craigie, Chief of the Engineering Division, led the movement and staff discussions for the new institution. Their efforts were rewarded on 21 November 1945. On that date, a letter from the office of the Chief of Air Staff to the Air Technical Service Command authorized the Institute project, and on 5 December, the Adjutant General officially authorized the Army Air Forces Institute of Technology.

Although a tradition of the developments from 1914 onward did exist and did serve to show patterns of progress in technological education, new assessments were necessary and new perspectives had to be evaluated. To these purposes, the Office of the Chief of Air Staff provided for the appointment of a Resident Committee of the Air Technical Service Command to prepare an operating plan for the proposed Institute. Lieutenant General Nathan F. Twining, Commanding General of the Air Materiel Command (formerly ATSC), appointed to this Committee Colonels D. J. Keirn, C. T. Munroe, W. A. Davis, W. B. Gibson, and Major L. D. Ely. In January 1946, this Committee framed an agenda which included proposals for key personnel, salaries, courses, and prerequisites.

During this same period, Dr. Theodore von Karman was serving as special consultant to the Commanding General, Army Air Forces, and as Chairman of the Scientific Advisory Board. He appointed a group of civilian scientists to review and extend the work of previous committees and to prepare a study of technical educational requirements in the Air Force. This group, known as the Markham Committee, consisted of: John R. Markham, Massachusetts Institute of Technology; William H. Pickering, California Institute of Technology; E. E. Sechler, California Institute of Technology; and T. H. Troller, Case School of Applied Science.

In May 1946, Brigadier General Mervin E. Gross was appointed the first Commandant of the Institute and Mr. Ezra Kotcher, formerly senior professor of the Air Corps Engineering School, was appointed Director. By this time, the Resident Committee had appointed some of the faculty and staff members and had arranged for space allotments at Wright Field for

Institute facilities.

Lieutenant General N. F. Twining officially dedicated the Army Air Forces Institute of Technology on 3 September 1946. Also present were Major General B. W. Chidlaw, Deputy Commanding General, Engineering, Air Materiel Command; Brigadier General M. E. Gross; Colonel Joseph T. Morris; Colonel D. L. Putt; and Captain L. F. Adams, U. S. Navy.

The Army Air Forces Institute of Technology was established as a part of the Air Materiel Command and was under the control of its Commanding General. The broad supervision of the Army Air Forces Institute of Technology curricula was a function of the Air University and policy supervision was by Headquarters, Army Air Forces. Policy direction and technical supervision were the responsibility of the Deputy Commanding General, Engineering, Air Materiel Command, until 1 July 1947, when the Institute was placed directly under the Commanding General, Air Materiel Command. The change was initiated by the second Commandant of the Institute, Brigadier General E. P. Sorensen, who saw many advantages in placing the Institute directly under the Commanding General, Air Materiel Command, rather than submerging its functions and activities in any one section of the Command.

In 1947, when the Air Force became an autonomous unit in the military establishment, the school became the United States Air Force Institute of Technology. At that same time, Wright Field, with its extensive research and development activities, was combined with neighboring Patterson Field, center of Air Force supply and maintenance activities, to form the present single installation, Wright-Patterson Air Force Base. It was singularly fortunate that the Institute should develop in the same geographical location as the very Air Force activities in research and materiel that would continue to prove such rich sources of application for academic progress in engineering and business administration. A constant and still increasing component of the academic versatility of the Institute is its close coordination with other developments at Wright-Patterson. Similarly, it has been able to make consistently valid contributions, through research projects, to the Wright Air Development Center and Headquarters, Air Materiel Command.

New Innovations

The third Commandant of the Institute, Major General Laurence C. Craigie, was assigned on 3 September 1948. During his tenure, the Civilian Institutions Program, through which a great variety of Air Force educational programs at civilian universities are administered, was transferred from Headquarters, Air University, to the Institute. By this action, all similar activities in higher edùcation were combined in one Air Force organization. Under this Civilian Institutions Program, the Institute designs, selects, and administers, both technical and nontechnical courses of study at leading civilian colleges, universities, hospitals, and industries in the United States and abroad.

The Air Installations Engineering Special Staff Officers Course was established as a component of the Institute in October 1947, and enrolled its first class in March 1948. Organized to train officers for installations engineering duties at air base, major command, and Headquarters USAF levels, the School of Installations Engineering, as it is now known, offers basic and advanced courses of study in all the functions and activities of air base

construction, operation, and maintenance. The central emphasis is upon the technical, managerial, and administrative responsibilities of the installations engineer.

On 1 April 1950, command jurisdiction of the Institute was transferred from the Air Materiel Command to the Air University. In July of the same year, Major General Grandison Gardner was appointed to succeed General Craigie as Commandant. He was followed by Brigadier General Leighton I. Davis who was appointed in January 1951. General Davis was reassigned in October of that year to Air Research and Development Command.

Graduate Level Work

In January 1951, eight officers were enrolled in the first Advanced Engineering Management course. Initiation of this course was an important step in the development of the extensive graduate-level work that was to dominate resident instruction at the Institute. The organization of new resident curricula at the Institute has been deeply influenced by sharp realization of the need for more work at the graduate level to meet the increasing technical demands being placed on officers in the Air Force.

Major General Ralph P. Swofford, Jr. served as Commandant of the Institute from October 1951 to November 1955. During his administration, efforts were initiated to secure professional accreditation for the School of Engineering. Their efforts were greatly assisted by Dr. Roy A. Seaton who filled the post of Academic Director from 1954 until his retirement in 1957. Accreditation was finally attained during the period in which Major General J. K. Lacey was Commandant. The Engineers' Council for Professional Development formally accredited the undergraduate aeronautical and electrical engineering curricula in 1955, and Congress passed legislation authorizing the granting of degrees. The first degrees, both Bachelor of Science and Master of Science, were conferred during the graduation exercises on 13 March 1956.

In May 1958, the School of Business of the Institute was admitted to full membership in and accredited by the American Association of Collegiate Schools of Business. With this recognition, the Institute is authorized to grant the degree of Master of Business Administration.

The present culmination of the Institute's long development is well summarized in a list of the current primary mission divisions of the organization: the School of Engineering, the School of Business, the School of Logistics, the School of Installations Engineering, and the Civilian Institutions Programs.

The fact that the resident colleges of the Institute are now fully accredited by the appropriate professional organizations suggests and indeed underlines interesting parallels between the growth of the Institute and the more general growth of educational patterns in the United States. Clearly, the academic standards that were formulated and followed in the optimum fulfillment of precise Air Force needs in higher education were by no means unlike criteria separately arrived at by civilian educational analysts. Every Institute program is deeply involved with the growth of the Air Force, but it is also sufficiently in harmony with the trends in American education to be entirely acceptable to accrediting agencies.

Now under the command of Brigadier General Cecil E. Combs, who was appointed Commandant in September 1957, the Institute is in its fourth decade of technical and professional education for Air Force officers. Its his-

tory is one of educational progress in and for a world of technological acceleration, and its accomplishment is one of constantly larger and closer coordination with other Air Force commands and of partnership, through its distinguished graduates, in the growth of American airpower.

Current Problems

The greatest problem of contemporary higher education is to continue to evolve methods and means of producing the technician who is also a man of broad education and comprehension. It cannot be doubted that Air Force officers must be such men. Technical education makes immediate demands, consumes time and resources, and produces quick applications, but it does not by any means completely equip the officer who must be capable of increasingly complex decisions based upon wide learning and critical judgment. The Engineers' Council for Professional Development and American universities strive for resolution of this problem by insisting on the inclusion of socio-humanistic studies in technical curricula. The Institute has made similar provisions and must continue to grapple with the dilemma of time and subject matter. It is almost a truism of any present historical analysis that our ethical and political acumen is inferior to our technological progress. Because the growth and vigor of science and the technologies are accompanied by enlarging problems in the applications of democratic ideas, the Institute must, even in the solution of immediate problems, be guided by the larger perspectives.

Although this bare historical sketch shows a development from the experimental schooling of one officer to the operation of a complex of schools for thousands, it is no more than a sidelight of the incredible growth of the technologies of airpower. The Greeks, in their best days, seem always to have considered the pursuit of knowledge a luxury for the aristocrat, and even the early scientists of the 17th century, whose discoveries set off the scientific revolution that is still expanding, pursued knowledge for its sake alone. But knowledge is now involved with power and power with national survival, and power in the air is possible only through unresting pursuit of a host of difficult technologies.

The growth of the Institute may be correlated very closely with this pursuit. Our security and leadership in the technology of necessary power have been jolted by the aggressive showmanship of other political creeds, but the frontiers of comprehension and application are, even beyond F. J. Turner's thesis, continuingly significant in the vitality of American democracy. Our responses to the challenges of the unknown, of the fuller fruitions of man's life, and of the continuance of democracy as a living social philosophy —these responses are related to our faith in education, and they are our strength.

The growth of the Institute and the educational decisions still being made in that growth are indications of how much must be known and how much must still be discovered, not only in technology, but perhaps even more emphatically in the humanities and the basic sciences. Not the least of Air Force responsibilities is to determine these needs wisely and for the long struggle ahead. This task is not a job for the Institute of Technology alone. It requires the coordinated efforts of the Air University and the major commands, and will demand the best thought and most inspired foresight that the Air Force can produce.

THE GENESIS OF NAZI *Luftpolitik* 1933 - 1935

By DR. EUGENE M. EMME

Adolf Hitler's stellar success as a "cold war" strategist before World War II resulted in large measure from his exploitation of air power as a diplomatic weapon. This exploitation has been termed "Luftpolitik," *or the use of an "air-oriented policy" in national statecraft. Most historians as well as American airmen fail to realize that the* Luftwaffe *of Nazi Germany won its greatest laurels in the diplomatic conflict preceding the shooting phases of World War II. And, an appreciation of the intimate relationship usually existent between a nation's domestic politics and its posture in international politics is often lacking when assessing the strategic intentions of a dictatorship such as Nazi Germany or Soviet Russia. Strategic controversies in a democratic nation are, of course, well appreciated as the nature of open discussion and debates on policy often works to disadvantage in meeting the militant challenge posed by the monolithic totalitarian states.*

This article is a continuation of the historical case-study begun with "The Renaissance of German Air Power," which appeared in the July 1958 issue of The Air Power Historian. *It likewise was drawn from a more detailed monograph entitled* LUFTPOLITIK: The Impact of German Air Power Upon History, 1919-1940. *It submits the thesis that Nazi* Luftpolitik *grew out of the exploitation of air power as a political weapon within Germany itself during the early days of the young Nazi Government. Subsequent articles will treat with Nazi* Luftpolitik *so effectively employed as a diplomatic weapon in international affairs from 1935 through the Rhineland, Spanish Civil War,* Anschluss, *Munich, and Prague crises, until the end of the Phony War in May 1940.*

Dr. Eugene M. Emme is a Project Director in the Operations Research Office, Office of Civil and Defense Mobilization, Battle Creek, Michigan. During World War II, he was a civil flight instructor for C.P.T. and A.A.F. contract schools, later a Naval Aviator and historical officer. He was subsequently an instructor of history at the State University of Iowa (1946-48) and a Research Analyst with the Air University (1949-1958). He is a Major, USAFR (Inactive). He is a member of the Board of Editors of The Air Power Historian, *a trustee of the American Military Institute, and was founding Commander of the Montgomery Squadron of the Air Force Association.*

The strategic challenge posed for Germany by the Treaty of Versailles helped spawn the *Luftwaffe* of Nazi Germany. In its turn, the consolidation of power in the hands of the Nazi elite after 1933, provided the genesis of *"Luftpolitik"* or the "air-oriented policy" of the Third Reich which was

to prove of such great consequences in scaring Britain and France into the surrender at Munich in September 1938. In combination with the shock of the sudden limited war on Poland called a "Blitzkrieg," the strategic use of air power as an instrument of policy by the Third Reich was to help create a "Phony War." In the winter of 1939-40, words and pamphlets instead of bombs were the principal weapons of combat. The below chapter in our consideration of the rise and fall of the German Air Force as an influence upon the course of history focuses upon the evolution of *Luftpolitik* as a result of the employment of air power by the Nazis within Germany itself before 1935. Such use of air power as a weapon of domestic policy is a story without precedent or parallel.

From the beginning hours of their reign, Adolf Hitler and his political chief of staff and onetime airman, Hermann Goering, instituted propaganda and policies designed to buttress their at first shaky position of control. Their goals were to capture public sentiment, eliminate the enemies of the Swastika, and to promote the general economic recovery of Germany. Part and parcel of this campaign was the opportunistic, often intuitive, generally noisy, and, in the end, rather successful application of *Luftpolitik*. It contributed so well as a persuasive catalyst of public sentiment for the Nazi cause within Germany, that *Luftpolitik* was, by 1935, placed without question into support of Hitler's foreign policy objectives. But the exploitation of an "air-oriented policy" to support the diplomatic strategy of the Third Reich came only after the position of the Nazi elite within Germany was secure. This important story, readily documented from available sources, has never been brought into clear focus. Though Hitler determined that the rapid creation of an air force offered the quickest way to restore Germany's military prestige in Europe, such air rearmament efforts never kept pace with the political objectives and the resultant military tasks set out for the *Luftwaffe* by the Fuehrer. *Luftpolitik* was, in essence, to provide the effective margin to back up Hitler's ambitious policies with the propaganda-bloated image of German military power created in the eyes of European statesmen. Never a bluff, the weaknesses and limitations of the *Luftwaffe* as a military arm were never fully appreciated abroad until the end of World War II. Such were the advantages which accrued to a discontented dictatorship in attaining its diplomatic victories over the democratic *status quo* nations before the beginning of World War II.

Nazi Roots of *Luftpolitik*

Ten years before becoming German Chancellor, Hitler had expressed his appreciation for the importance of mass-opinion with regard to rearmament in *Mein Kampf:*

> Any resurrection of the German people can take place only by way of regaining external power. But the prerequisites for this are not arms, as our bourgeois "statesmen" always babble, but the forces of will-power . . . The best arms are dead and useless material as long as the spirit is missing which is ready, willing and determined to use them. . . .
>
> Therefore, the question of regaining Germany's power is not, perhaps, how we can manufacture arms, but, how can we produce the spirit which enables the people to bear arms? Once this spirit dominates a people, the will finds thou-

sands of ways, each of which ends with weapons.[1]

Most Western strategists never took *Mein Kampf* seriously soon enough, as is well known.

The political air weapon of the Hitlerian regime emerged out of the domestic policies of the early Nazi Government and then was extended into European affairs. It had its roots in the experiences of the Weimar period to be sure. But it evolved under the nihilistic but power-conscious program fostered by and, in turn, exerting influence upon the actions of the Nazi leaders. Above all else, *Luftpolitik* in Nazi Germany was a stepchild rather than a deliberately conceived offspring of Hitler and his cohorts during the dynamic course of events after 1933.

Just before his accession to power, Hitler confided that in the event of a future war:

> In the air we [Germany] shall of course be supreme. The air offers many possibilities. We shall surpass all competitors. We have only one serious rival in this field: the English. The Slavs will never learn to fight in the air. It is a manly weapon, a Germanic art of battle. I shall build the largest air fleet in the world. We shall have the most daring pilots. Of course we shall have a great army as well . . .
>
> How to achieve the moral breakdown of the enemy before the war has started?—that is the problem that interests me. Whoever has experienced war at the front will want to refrain from all avoidable bloodshed. Anything that helps preserve the precious German blood is good . . . Mental confusion, contradiction of feeling, indecisiveness, panic: these are our weapons . . . The lessons of revolution, these are the secret of the new strategy. I have learnt from the Bolsheviks. I do not hesitate to say so. One always learns from one's enemies. Do you know the doctrine of coup d'etat? Study it. Then you will know our task.[2]

Here, in essence, was a central concept underwriting Nazi *Luftpolitik*.

In his political campaign for gaining control of Germany on the sidewalks and in the forum, not to forget the active use of clubs and thugs, Hitler was obsessed by an impulse for revenge against the enemies of Germany both within and abroad. He exploited the defects of the Weimar Republic, heaped invectives upon the Jews and Communists, and distorted the humiliation of the defeat of 1918. Impervious to reason, ethics, and humility, he played upon extreme patriotic sympathies and social animosities; alternatively played off opposing political forces against each other, and appeared to be concentrating his efforts first towards one objective and then another. By a series of tangential, often faltering steps, Hitler attained his goal.[3] Once Chancellor in Germany, Hitler had the organizational control, and, when necessary, the legitimate backing of physical force to exploit conditions within Germany to political advantage. Once Germany was rearmed, particularly when it appeared to have quickly rearmed with the mushroomed image of Goering's

[1] *Mein Kampf*, complete English edition published by Reynal and Hitchcock (New York: 1939), pp 459-60.

[2] See Herman Rauschning, *Voice of Destruction* (New York: 1940), pp 9-10.

[3] See H. Rauschning, *The Revolution of Nihilism* (New York: 1939); E. M. Earle, "Hitler: The Nazi Concept of War," in *Makers of Modern Strategy* (Princeton: 1944), pp 504-16; and B. H. Liddell Hart, "Hitler's Strategy," in *The Strategy of the Indirect Approach* (London: 1946), pp 291-309. Best single volume is Alan Bullock, *Hitler: A Study in Tyranny* (London: 1952).

Leutnant Hermann Goering shown in the cockpit of his fighter, an Albatros D III, in 1917. Goering was appointed to command the famed Richthofen Squadron at the age of 25. He shot down twenty-two allied planes by 1918 and had earned the Pour Le Mérite. After the Armistice in Nov. 1918, Goering heroically led his entire squadron in a flight back into Germany rather than surrender their aircraft to the victors. (This photo taken from the private photo albums of Goering, now in the Library of Congress.)

Luftwaffe, Hitler was able to substantiate German strategy in foreign affairs with the persuasion of intimidating military force.

Early Mobilization of German Aviation

Under the magic slogan of *Gleichschaltung* ("coordination" or "synchronization"), the influential efforts of the young Hitler Cabinet upon German aviation after 1933, as in all German affairs, were to have far-reaching consequences. During the integration of political power in the hands of the Nazi elite, in the immediate attention devoted to restoring stability to the German economy to eliminate the widespread unemployment, and in the concurrent campaign to re-establish the prestige and power of the Reich in international affairs, most major aspects of German aviation were integrated as a matter of course into the Hitlerian program marshalling power for power's sake within a totalitarian state. German aviation was mobilized between 1933 and 1935. The new regime fully exploited the aggravated desire for a revision of the humiliating Treaty of Versailles, which had previously sanctioned, as we have noted, a small-scale rearmament program even during the dying days of the Republic. By March 1935, after a little over two years of effort, the Nazi government removed the wraps of secrecy from German air rearmament and openly announced with an extreme exaggeration of truth that the new Nazi-built *Luftwaffe* was as strong as any air force in Europe. Within

two weeks after its legal birth, the German Air Force was announced as being capable of defending Germany from the rain of destruction which any threatening nation might release over the Fatherland. This was a bald lie. But within two years, Hitler's program had the outward appearance of accomplishing by force and dictatorship within Germany, and by the brusque methods of defiance and repudiation in international affairs, that which the Weimar Republic had been unable to accomplish in fourteen frustrating years.

Neither Chancellor Hitler nor his chief deputy, Goering, had actively engaged in any significant aspect of German aviation during the Weimar period.[4] During his whirlwind campaigning of 1932, Hitler had made unprecedented use of a special *Luft Hansa* airliner made available to him by Erhard Milch. And, Goering, a deputy in the Reichstag after 1929, had, upon occasion, engaged in politically oriented speculation about the future of German aviation under the Nazis, once they came to power.

The new German Government of January 1933 at once set about mobilizing aviation to politico-military advantage. This effort was characterized in its outward form by the stimulation of popular support for the Nazi plans for a revitalized Germany, and, inwardly, by the administrative decrees centralizing the control structure of the nation in Nazi hands. Three days after taking office, Chancellor Hitler named Goering as Minister without portfolio to administer a Federal Commissariat for Aviation. In April 1933, Hitler laid down the long-range objectives of the nascent rearmament program to be such that within five years he could possess armed forces which "he could place in the balance as an instrument of political power."[5] And, after four months in power, in May 1933, the Federal Ministry of Aviation (*Reichsluftfahrt Ministerium*) had been created and Air Minister Goering was destined to possess the controlling reins of German aviation.

Goering's leadership in the "synchronizing" process consolidating the power of the Nazi elite involved much more than just his mobilization of German aviation. It should not be forgotten that he played the indispensible role in the Reichstag fire device, which eliminated in one fell swoop all organized political opposition to the Nazi party. In spite of his limited aeronautical experience between 1918 and 1933, Goering not only helped popularize Germany's "air-forceless" position in Europe and lent considerable prestige to the Nazi movement, but he also forcefully carried the cause of air power directly into the highest office of the German Government.[6]

It is difficult to recreate the fantastic concern of Europeans for the "air menace" in 1932-33. Germans

[4] See W. Frischauer, *The Rise and Fall of Hermann Goering* (Boston: 1951); E. Butler and G. Young, *Marshal Without Glory* (London: 1952).

[5] *Nazi Conspiracy and Aggression*, Volume VI (Washington: 1946), pp 946-47. Examination of all available source material indicates that there existed no master plan in 1933 for building a military air force. An index of Germany's industrial and technical capacity, however, was thoroughly prepared. Hitler's desire for a politically impressive air force was coupled with the theoretical planning of the Reichswehr airmen before 1933, and seems to have largely determined the manner in which the air rearmament program of the Third Reich developed. Critical bottlenecks and shortages later evidenced were not only the result of the makeshift and politically oriented planning but also the magnitude of the rearmament program itself.

[6] See Emme, "The Reichsminister and the Luftwaffe," *Air University Quarterly Review* (Winter, 1951-52), pp 113-17.

were particularly apprehensive. The significance of German apprehension was the manner in which it assisted the Nazis in gaining domestic power, and ultimately in providing Germany the lead in the international air rearmament race soon to unfold. No nation had been immune to the popular apprehension developed after 1918 regarding the total nature of war in the future since poison gas and bacteria were the weapons of mass destruction which could be delivered to the heart of the enemy nation by aircraft. When Germany had entered the League of Nations in 1926, hopes for international disarmament and the outlawing of inhumane weapons had flourished. Such hopes were dashed against the rocks of resurgent nationalism springing out of the world-wide economic depression and the demonstration of war as an instrument of policy by the Japanese invasion of Manchuria in 1931.

From 1930 onward, tons of paper and floods of ink had been poured out in the German press on the subject of air-raid precautions and the Reich's extreme vulnerability to air attack. Efforts of the German Government to secure international approval of possession of a sample air force by revising the Treaty of Versailles undoubtedly contributed to this concern. But the facts of German geography were self-evident. Germany's central location in Europe, its concentrated urban population (65% of the total population located in cities and industrial areas), and Germany's lack of an air force—these were widely circulated thoughts in the serious and journalistic German press. They were moreover views stimulated, if not directly fostered, by the dire predictions of future warfare aired at the world disarmament conference at Geneva. Stanley Baldwin's acknowledgement in the British House of Commons in 1932 that "the bomber will always get through to kill women and children first" in a new war, was not to have the political ramifications in England than much less descriptive exhortations in Germany by the Nazi leaders a year later.

Air Sports and Civil Defense

In March and April 1933, the mobilization of German aviation was instituted with considerable fanfare within two major organizations: the *Deutsche Luftsport Verband* (German Air Sport Association, *DLV*); and the *Reichsluftschutzbund* (Federal *Air Protection League*, RLB). Although ostensibly civilian in character in spite of the blue-gray uniforms adorning their members, both the *DLV* and the *RLB* were to represent organizations geared to the control of mass-opinion in Germany and the furtherance of air rearmament in a manner circumventing the restrictions of international law and opinion abroad. Accorded the same privileges as the Storm Troopers (*SA*) and the Elite Guard (*SS*), and enthused by the publicity and financial attentions showered upon civil aviation, the members of the *DLV* and the *RLB* indirectly supported, if they did not do so openly, the overall Nazi program.

Organized on March 25, 1933, the *Deutsche Luftsport Verband* "coordinated" the activities of some three hundred civil flying clubs and aeronautical societies into one central association rationalized to State policies. Organized into regional groups (*Landesgruppen*), the *DLV* rapidly grew to comprise some 2,500 clubs. Under slogans such as "the German people fly again," the membership of this uniformed "civilian" air force

grew from some 60,000 to 500,000 active members in less than two years. It was thus that an enormous training program was instituted under the disguise of civil sports. In effect, *DLV* constituted Germany's secret air force viewed with great alarm by the intelligence officers in other European nations.

Officially founded the day before Goering became Air Minister (May 4th), the *Reichsluftschutzbund,* on the other hand, was a key political device of the Nazi leadership. Its nucleous was the *Deutsche Luftschutz,* which had been founded by former members of the *Flakverein* in 1927. Commanding all of the propaganda appeals, the program of the *RLB* was related to the campaign waged against the unilateral disarmed position of Germany in European affairs. The enlistment of air protection wardens, the construction of air-raid shelters, and the mobilization of popular opinion was launched after a gigantic propaganda stunt—the so-called "Reichstag Fire of German Aviation." On June 24, 1933, all Berlin newspapers announced that unknown foreign aircraft had bombed the German capital with anti-German pamphlets. Although the pinpoint accuracy of the bombing by foreign planes permitted none of these insulting leaflets to fall outside of the Wilhelmstrasse, the Berlin press and its advertising pillars stated:

> Today it is only our enemy's leaflets, but tomorrow it will be bombs. Germans, arm yourselves, form air protection sections.

Dummy bombs as high as a man were erected throughout Berlin as a grim warning. Two days later the *Reichsluftschutzbund* was officially and noisily instituted.

Simulated air raids, practice blackouts and an effective press campaign were, in 1933 mind you, to create successfully sufficient fears among the German populace of French, Polish, and Russian aerial monsters to enlist one million active members in the *RLB* within a year, and five million members by the time the veil of secrecy was removed from the nascent air rearmament program in 1935. One *RLB* poster was especially designed for children: "Save your pfennigs for the *RLB* and live to grow up."

The promotional efforts of the Nazi-controlled press were, at this moment, as later, to far outdistance the production of military aircraft in Germany. The traditional Bismarckian "nightmare" of a two-front war was magnified by the Nazis into a menacing cloud of enemy aircraft which now threatened the livelihood of the entire civilian population in every city or hamlet. The fitting of gas masks, the construction of shelters, and the filling of sand buckets were actions of political consequence motivated by fearful thoughts about the potentialities of aerial bombardment in a future European war.

During the summer 1933, the stimulation of sport flying under the DLV and the popular concern created for Germany's ineffective air defenses under the RLB, contributed importantly to the Government's campaign for military equality at the international conference table in Geneva. Air Minister Goering repeatedly assured Germans that the horrors of aerial bombardment would be spared Germans by the Nazi leadership. Goering's slogan that "Germany must become a nation of fliers" should not, it seems, be exaggerated as a determining influence upon the outcome of the controlled election of November 12, 1933, which granted the Nazi Party (N.S.D.A.P.) its first bandwagon majority. The Communist and

Social Democratic opposition had already been liquidated while the Nazi slogan of "Peace and Equality of Rights" dissolved most of the remaining opposition. Nevertheless, Germany, by the end of 1933, already possessed perhaps the most air-minded citizenry of any nation in the world, one which was consciously aware of the Third Reich's central position in European air affairs. *Luftpolitik* was not, however, an unimportant political weapon helping the Nazis to consolidate themselves in power. There were other aspects of this.

Internal Consolidation

Underneath the popular concern fomented for air defense and the foreign policy campaign for *de jure* military equality for Germany to include an air force, were the ministerial

Hitler departing from an historic session of the Reichstag at Weimar on Jan. 30, 1933, at which he took office as Chancellor. Following the death of President Hindenburg on August 2, 1934, and the dissolution of the Reichstag, Hitler assumed supreme command of the newly created fascist totalitarian state as Reichs-Fuehrer. (This photo was taken from a private photo album of Adolph Hitler, now in the Library of Congress.)

decrees which progressively integrated control of all German aeronautical activity in the Federal Government. Military planning, aircraft production, research and technical development were matters which the Nazi leaders were forced to leave primarily in the hands of specialized and professional people. The immediate political worth of air rearmament as well as its ultimate diplomatic and military purpose was manifested throughout the Nazi-approved air program for Germany in 1933-35.

Commercial air transportation, for example, was early recognized by Goering and Deputy Air Minister Erhard Milch, former director of *Luft Hansa,* as a symbolic means of enhancing German pride as well as sympathy abroad for the economically efficient and technologically progressive nature of the "New Order." Previously a state monopoly in a conventional sense, the character of *Luft Hansa* was fundamentally altered after 1933 quite beyond its increased function in the rearmament program (i.e. an *ersatz* bomber force and operational flight training). Milch's commercial airliners like Mussolini's trains not only ran on time, but its schedules were considerably increased and its routes expanded. Political rather than economic reasons, for example, prompted the development of connecting schedules with the German-dominated airlines in South America. In Nazi-inspired literature, Hitler was affectionately referred to as the "Flying Chancellor" because of his consistent use of *Luft Hansa* aircraft for the bulk of his travel. In a book published for consumption both within Germany and abroad, one author wrote:

> This growth of civil aviation in Germany bears eloquent testimony to the strength of the progressive economic recovery and, as a result of careful planning and popular enlightenment to the spread of air-mindedness among the German people.
>
> The (Lufthansa) airliner appears as envoy of its nation and herald of Germany's spirit of enterprise and talent for organization.[7]

Continued technical growth of *Luft Hansa* after 1933 was extolled by the German-controlled press as representative of the efficient Nazi leadership. In fact, however, no nation can build a military air force from scratch overnight.

Aircraft production and the construction of airfields, hangers and an enormous Air Ministry building in Berlin, all manifested the political role of air rearmament in Nazi Germany. Immediately in 1933, aircraft production was expanded as quickly as possible. Though this policy required the mass-production of obsolete and civil type aircraft, it served the dual purpose of providing aircraft for the pilot training program and promoted the numbers of aircraft with which to impress the German populace. Foreign observers were, as we shall later see, also impressed.

One prominent officer discussed the policy of seeking immediate propaganda value by building symbols of Nazi achievement rather than installations of ultimate military value as follows:

> The first *Luftwaffe* installations, whose basic design with all of its weaknesses, was preserved throughout the early years of rearmament, gave a completely peaceful impression. Their large, solid and crowded buildings, their narrow strips, as well as their completely inadequate pro-

[7] Cesare Santoro, *Hitler's Germany as Seen By a Foreigner* (Berlin: 1938), p 288.

tective installations against air raids, appeared to ignore any danger from the air. These buildings were the pride of the *Luftwaffe,* the envy of the Army, the outrage of the Party, and caused many old soldiers to shake their heads since they feared that these barracks too much resembled hotels and sanatoria and would soften the inmates.[8]

The lavish Air Ministry Building, known as the *Haus der Flieger,* was rushed to completion after secrecy no longer cloaked air rearmament. When it was dedicated by Goering on October 12, 1935, he said:

> This house is also a symbol for the rebirth of our Air Force, a symbol of forward storming spirits, of passionate energy which rules us all for this instrument, which was broken for us at one time, which was denied to us, because it was known with what spirit we would fill it. But we have allowed it to rise again today, so that a strong Air Force could protect the Reich once more.[9]

The public utterances of Goering and Hitler, as well as the physical appearances of the air rearmament program, were to augment increasingly the Third Reich's diplomatic and psychological campaigns in foreign affairs.

Emergence of the *Luftwaffe* Officer Corps

The intimacy between the Nazi Party and the *Luftwaffe* Officer Corps, as distinct from but similar to the political fate of the Army and Navy officers in their relation with the Nazi leadership, would require detailed study beyond the brief confines of this article. Due to Goering's preoccupation with high-level political matters in the early years, the initial expansion of air rearmament left the bulk of planning and administrative details in the non-Nazi hands of ex-members of the *Fliegerzentrale,* who resigned their *Reichswehr* commissions to assume "civil" posts in the Air Ministry. Headed by General Walter Wever (later first Chief of Staff of the *Luftwaffe*), the professional leadership of the secret air force proper (distinct from the *DLV*) closely adhered to the doctrines of "political neutrality" and the "independent air force" established by von Seeckt. It is important, too, to note the early lack of direct Nazi pressure upon the secret *Luftwaffe.* Hans Stumpf, who headed the Personnel Section, placed professional officers rather than outright Nazis or unsoldierly civilians coming from police organizations and civil aviation, in responsible positions. Deputy Air Minister Milch, however, became a member of the Nazi Party in 1933, and subsequently received "honorable Aryan" status. "Lazy Bruno" Loerzer and Karl Bodenschatz were the only later outstanding examples of early Goering appointees. Captain Brandenburg, who had handled much of the pre-Nazi secret air rearmament, resigned in 1934.

Although much of the Nazi ideology was repugnant to the overwhelming number of professional air officers groomed in the *Reichswehr,* the impetus for unlimited rearmament made Nazism more tolerable. Goering's exhortations, for the most part, were apparently comfortably rationalized by most of those actively engaged in the air build-up. In addition, those enthusiasts of the younger generation drawn towards the glamorous attraction of aviation, as well as the old war-veterans returning to the *glorie Richthofen,* had little desire to question the

[8] Herbert J. Rieckhoff, *Trumpf oder Bluff?* (Geneva: 1945), p 109.

[9] *Political Testament of Hermann Goering* (London: 1934), pp 148-55.

A rare and unusual photo of Goering with Adolph Hitler and Generalleutnant Wever, who was the first Chief of the Luftwaffe General Staff. This photo, from a private German file, was taken about 1935, when the Luftwaffe was in the process of re-genesis.

ultimate objectives towards which Nazi dynamism was headed. In a typical speech to the members of the secret *Luftwaffe* on June 24, 1934, Goering reaffirmed the central theme of the Nazi air program:

> Young Germany shall be brought up with a passion for flying in order that the German nation shall become a nation of fliers. Other forms of flying [i.e. military] are not allowed us, but I have never left any doubt that things cannot remain like this . . . As long as other nations own bombers Germany must possess an air service which guarantees the security of life and of the nation.[10]

Hours after the death of President von Hindenburg on August 2, 1934, Goering dramatically led all senior *Luftwaffe* officers in taking a personal oath of loyalty to Adolph Hitler. Thus the

[10] *Ibid.*

German Air Force officer corps paid the political price for all-out rearmament and the benefits of rapid promotion. By March 9, 1935, the *Luftwaffe* was publically instituted in defiance of the Treaty of Versailles. The Nazis had made good their promise to the German people to restore full military sovereignty to Germany. The standing joke was that Goering's pet lion ate a "civilian" administrator for breakfast each day. In fact, these "civilians" now wore *Luftwaffe* uniforms.

Nazi Influence on Air Doctrine

Professional air strategists in early Nazi Germany were fervent advocates of the widely circulated concepts of air warfare as postulated by Giulio Douhet. Douhet's "Command of the Air" had been published in Germany in 1929, while some of Billy Mitchell's articles appeared in 1933. Factors promoting the acceptance of Douhetism in Germany were: the stagnant deadlock of position warfare on the Western Front during World War I; the "stab in the back" legend of the 1918 defeat which pointed out the role of the home front in modern war; the limitations of German manpower and industrial capacity in sustaining a lengthy war effort; and, the obviously weak posture of German military power in 1933-35. All of these considerations made Douhet's theory a rational one for most German air strategists. It was thus, as is often not appreciated, that the non-Nazi military leadership of the secret *Luftwaffe* before 1935, set about building an air force capable of employment of concentrated firepower against the so-called heart of an enemy nation's will to fight—the morale of the civil populace. General Ludendorff even proposed in his book called *Total War* (1935) that in a future war the Air Force must be first employed in defeating the enemy's army. Then, the Air Force could be directed against the hinterland of the enemy nation. With regard to bombing of civil populations, he wrote that "bombing squadrons must inexorably and without pity be sent against them." Ludendorff, of course, was neither an active officer nor an airman.

In an address opening the Air Warfare Academy in Berlin-Gatow in November 1935, General Wever, now the first Chief of Staff, indicated the doctrine of the *Luftwaffe* under the Nazis:

> National Socialism has realized for us the aim which they [the creators of the Luftwaffe] strived—a strong air force with independent status in the services. What does this mean? It does not imply that the Air Force wishes to carry independent warfare without regard to the operations of the Army and Navy. Just as in the civil community united movement by all towards one objective alone can lead to success. War in all its aspects can be directed only by one man.
>
> However it does mean that a new type of warfare has been added to operations on the ground and at sea—the struggle for command of the air. The realms of the air are not restricted to the fronts of the Army; they are above and behind the Army, over the coasts and seas, over the whole nation and over the whole of the enemy's territory. . . .
>
> The objective of any war is to destroy the morale of the enemy. The morale of a leader and of a nation is reflected to a great extent in the armed forces of that nation. Thus, in the war of the future, the destruction of the armed forces will be of primary importance.

After Wever was killed in the following year in an airplane crash, the

The first appeasement conference following Hitler's rise to dictatorial power. Foreign Minister Sir John Simon, of Britain, and his Deputy, Sir Athony Eden, confer with the Fuehrer prior to the German reoccupation of the highly industrialized Ruhr, which despite the mandates of the Treaty of Versailles, was unopposed. Simon sits at the immediate right of Hitler, with Eden next in line. (This photo was taken from a private photo album of Adolph Hitler, now in the Library of Congress.)

doctrine of the *Luftwaffe* was less well stated.

After 1935, the increasing appearance of Goering appointees in key positions in the *Luftwaffe;* the promotional efforts of the Goebbel's propaganda machine and publicity conscious Goering; and, most importantly, the high tasks set forth for the *Luftwaffe* as the objectives of Hitler's foreign policy expanded and magnified—these factors determined the fate of *Luftwaffe* doctrine. They not only determined the manner in which the military capacity of the *Luftwaffe* was designed during the years immediately before actual war, but they also determined the manner in which air power was exploited as a diplomatic weapon during a time of "cold war."

It was indeed ironic that the failure of the Allied nations to revise or to enforce the Versailles prohibition on a German Air Force provided Hitler and his cohorts with a valuable political devise to enhance the Nazi program for Germany. One realistic student of the Nazi State in 1937 wrote:

> Every German believes that what goes on in the Air Ministry will decide the country's fate, and no branch of service is more popular than the air force. That air force is viewed as Hitler's greatest achievement, the outward symbol of Germany's new-found strength, and the most satisfactory method of protection yet evolved.[11]

[11] Stephen Roberts, *The House That Hitler Built* (London: 1937), p 132.

The political support which the Nazi program received from air-minded enthusiasts in particular, and from the concern generated by the general populace for the Reich's "air-forceless" position in Europe, must be historically regarded as an indispensible factor in spurring the Nazi leadership towards further exploitation of air power as an instrumentality in the field of foreign affairs.

It was the bloodless diplomatic triumphs of Hitlerian Germany which, from 1935 onward, were of greatest significance to the course of historical events in the European core of world politics. Such victories, in large measure resulting from the application of Nazi *Luftpolitik* in international affairs, will be treated in subsequent chapters of the German air power story.

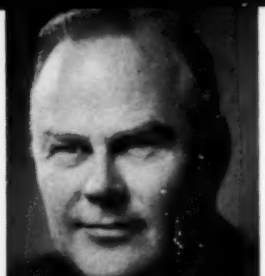
SOVIET PATTERNS OF CONQUEST

. . . "Far from being revolutionaries in the commonly accepted sense, the Russian communists have excelled in capturing nascent revolutionary movements launched by others. A succession of Soviet rules has not been able to improve on this lack of originality: nowhere has a *communist* revolution succeeded in establishing a communist government. Communist power, wherever it assumed control of a government, was first imposed upon the populace by Soviet armed might or the threat of Soviet military intervention. Even China is no exception, for the Soviet conquest of Manchuria and the propinquity of Soviet military power were important factors in the victory of Mao Tse-tung.

. . . . . .

Nothing illustrates more graphically the West's disregard for the canons of protracted conflict than its supine acceptance of Soviet penetration, first by proxy and then directly, into the Middle East."

—Dr. Robert Strausz-Hupé, *A New Look at Communist Strategy*, ORBIS, Vol. II, Spring 1958, University of Pennsylvania.



AIR TECHNOLOGY *as a Foundling*

By COLONEL EDWIN E. ALDRIN, USAF (Ret)

Colonel Aldrin can be truly classed as a pioneer in aviation technology. Following his graduation from Clark University, where he studied physics under Dr. A. G. Webster and Dr. Robert Goddard, the pioneer in rocket development,[1] he entered Massachusetts Institute of Technology and graduated in 1917 with a Master of Science degree.

He received his permanent commission as a lieutenant in the Coast Artillery Corps in 1917 and, six months later, was detailed to the Aviation Section Signal Corps and took his pilot training at McCook Field. At the completion of his training he was assigned directly to the Engineering Division, and at the termination of World War I, was the key individual in founding the Air Service Engineering School.

The Army's system of rotation diverted him for extended periods from the pursuit of his special talents. In 1921 he was assigned to the Army of Occupation in Germany. From this tour he was rotated to the Philippines. In 1924 he returned to the Engineering School as Assistant Commandant, but shortly thereafter was reassigned to Washington. While on this tour of duty he was detailed to MIT for graduate work in aerodynamic stability, which earned him a Doctor of Science degree in 1927. That same year he returned to Wright Field, and the next year he resigned from the Army and became associated with the Standard Oil Company.

Esprit de corps must have a firm support from tradition in any military service. Tradition, in turn, must be based on historical facts. It is to our misfortune that the Air Force story is being written in too large a measure by persons who had no personal experience with the early growth of military aviation, and the obstacles that were being continuously imposed to retard that growth. They may sense historical facts, but, seemingly, not the spirit of the early pioneers and their driving urge, against great obstacles, to make aviation grow. These pioneer airmen sensed the need for change in conventional military values, and it was their continuing efforts that set the stage and paved the way for the present independent and coequal status the military air arm holds with the older surface forces. If we take no lessons from these early struggles, the Air Force might well become as conventional and hide-bound as it was forced to be in early years while operating under Army Regulations and the General Staff.

We seem to have forgotten the air

[1] See July 1958 issue of *The Air Power Historian*, for an account by Dr. Goddard of the first experiments in liquid-propelled rockets.

travesty of World War I, when we were unable to supply airplanes that we built to our combat forces in France. The Hughes Investigation of World War I laid that failure to lack of technical training. We have been performing in a similar manner in the rocket field. Again, we have been doing too little and, characteristically, too late!

The Hughes Investigation in 1918 was fortunate in having assigned an officer who sensed the impelling need for technological progress in the combat feature of air weapons and had the courage to take action. Initiative was frowned on in those days of firmly cemented conventional values, and he inevitably created enemies in the War Department hierarchy. That officer was Major Thurman H. Bane who, after the war, became the first chief of the Engineering Division of the Air Service, Military Aeronautics, located at McCook Field, Dayton, Ohio. The Bureau of Aircraft Production had been there during the war.

I was one of the few civilians who had taken a course in Aeronautical Engineering at Massachusetts Institute of Technology before entering World War I, in 1917. I received my Masters degree in mechanical and aeronautical engineering after receiving a regular army commission in the Coast Artillery Corps. Naturally, I tried again and again to be detailed to the Aviation Section Signal Corps, but it was May 1918 before Major Bane located me, as I was about to sail for France in command of a battery of artillery, and had me reassigned to the Massachusetts Institute of Technology as an instructor in the Army and Navy School of Aeronautical Engineering.

After the Armistice in November 1918 we graduated the second class. Many now famous designers received their initial instruction at this school. Leroy Grumman was a graduate, and an outstanding example of the caliber of students who attended.

Meanwhile, the Air Service, Military Aeronautics was formed, and McCook Field was selected as the base for the Engineering Division. Major Bane, now Colonel, was assigned as Chief and Commanding Officer.

When I reported in February 1919, I was informed by Colonel Bane that I would become Chief of the School Section and was to organize a school along the lines of the Army Ordnance School of Application at Aberdeen, Maryland, which Colonel Bane had attended. Although I was anxious to avoid further school activity, the enthusiastic support by Colonel Bane at every turn made a complicated assignment a pleasure.

In operation we were to use Engineering Division personnel and equipment to give senior air officers an understanding of the engineering basis and analysis of current aeronautical equipment. The method of instruction was patterned after the Ordnance School and made maximum use of problems, free use of any assistance, some laboratory work, with a minimum of lectures.

The first students assigned began arriving in June 1919. By the end of July the full class was enrolled. The school had only one commissioned officer permanently assigned. That was I, a first lieutenant with primarily scientific and technical experience, a little military training, and only a general outline as a guide. The students were senior air field commanders during World War I, of field officer rank. As the school had neither the blessing nor approval of the War Department, it was designated locally as The Air School of Application. In November

1919 it was officially approved by the War Department as the Air Service Engineering School.

War Department regulations made the commanding officer of the station, commandant of the school. His executive could be assistant commandant. The officer in charge of the school was designated as secretary. In this case he also carried the title of Chief of the School Section, Engineering Division. Instructors, as needed, were drawn from the Engineering Division laboratories. Actually they acted more as consulting engineers. It was expected, with good reason, that the maturity of the student officers should enable them to search out and find the answers to their various problems, as we were making available the best laboratory and shop facilities that could be currently provided. This freedom from the academic boredom of sleep-inducing lectures and oversimplified examinations and grades, while not original, seems to have been forgotten in more recent years in the demands for identifying professional competence with a numerical brand and a mania for degrees.

What then was the incentive provided at this school? Surely not a fear of flunking, as it was well known that service schools seldom need resort to that procedure during times of peace. But with the fear of an unsatisfactory rating removed, the students applied themselves with a spontaneous enthusiasm to the challenging problems on which they needed better understanding. Where actual laboratory or field tests were necessary to clear up a problem, students, under supervision, conducted those tests and the knowledge they gained was real and lasting. For example, they requested with insistance, firsthand tests of the postwar developed parachute by live jumps

Lt. E. E. Aldrin is shown here at McCook Field in 1920 with two of the early type parachutes which he helped to test during his work at the forerunner of the Air Material Command.

from an airplane. When this was granted the bee was put on me,—so I jumped also. This was the initial class in 1920.

Generals Frank and Sneed, Colonels McIntosh, Rader and I are survivors of that first engineering class. New classes were enrolled annually except in the year 1927-28, during which the Engineering Division moved from McCook to Wright Field.

I returned from a two-year tour in the Philippines, and was again placed in charge of the school to re-establish the original system of instruction. Less experienced officers were, as a rule, then being assigned to the Engineering School. As an added incentive to these students I managed to obtain support for the election of selected graduates to the honorary scientific fraternity of Sigma Xi on the basis of demonstrated potential capability for scientific research. This was accomplished

through the cooperation of the chapter at Ohio State University. In subsequent years this merit recognition has not been used. This I think unfortunate, because it automatically gave recognition to the engineering school and its product in acknowledged scientific institutions.

Such was the modest beginning of technological instruction on air power weapon systems. It suffered from these modest demands for too long a time. Immeasurable profit could have been gained had we been able to recognize a little sooner the military meaning and worth of technological progress in the combat features of air power weapons. We officially recognize its significance today, but this belated recognition cannot retrieve the losses we have suffered because, in the past, we didn't see or sense the added military power that would be gained from a healthy rate of growth in combat capabilities of the air arm. Let's hope we've learned our lesson and won't forget it.

THE TIMING FACTOR

—"It used to take weeks and months to move conventional firepower to within reach of a target. And it took still more months and even years to apply that firepower effectively in order to attain the desired objective. In modern war, the combination of jet bombers and nuclear weapons can achieve the same objective in a matter of hours. Before too long, ballistic missiles curving through space will be able to compress these hours into minutes. Still further compression of time may seem impossible, but, if it can be done at all, it will be achieved through increasing utilization of space.

Therein, I believe, lies the real significance of strategic space operations of the future—the compression of time for both action and reaction to the point where the dramatic role of the time factor will, in effect, assume the significance of a new dimension in military strategy. Thus, our present concept of three-dimensional warfare will eventually expand into what may be termed warfare in four dimensions—warfare in which the operational relationship between space and time will become the most critical factor."

—Gen. Thomas S. Power, Commander in Chief, SAC, in an address to the Air Force Association, Dallas, Texas, Sept. 1958.

IMPACT OF WEAPONS TECHNOLOGY *on Air Warfare, 1941 - 1945*

By COLONEL JOHN J. DRISCOLL, USAF

As with a theatrical production, most of the seemingly unglamorous work of science and technology in the development of weapon systems, goes on behind the scenes. Only the finished product in aircraft configurations and the results of those products, in view of public or enemy appraisal, receive any worthwhile acclaim.

Since the development of the airplane as a weapon system, the glories of aerial warfare have usually been recorded in terms of edification for the skills and ingenuity of our fliers, and the capabilities, efficacies and destructive powers of our aerial weapons. Too quickly and easily we fail to consider, in comparison, both the positive and negative qualities of the enemy's weapon systems. We tend to degrade the over-all efficiency of his science and technology in the light of our flushing, and sometimes superficial, successes without relative consideration of comparative capabalities, weapon for weapon.

Colonel John J. Driscoll presents in a short historical treatise some of the highlights in the development and use of some of the German aerial weapons; the advantages accrued through technology and the results of shortsightedness on the part of German planners.

Prior to World War II, Colonel Driscoll was a research Metallurgist and Tool Designer. After he entered the USAAF in 1942 he served as a combat operations officer in Europe and North Africa, primarily with the Eighth Air Force. Following postwar studies in Germany and Japan as Chief, Air Weapons and Tactics Branch, U. S. Strategic Bombing Survey, he was appointed to the faculty of the Air War College, 1947-1949. After a tour in the Pentagon, he served as Advisor on Weapons and Tactics to the Commanding General, French Far East Air Forces, Indo-China, following a brief combat tour in Korea. He has since served on Professor von Karman's Advisory Group for Aeronautical Research and Development (NATO), Chief Air Section, U. S. Mutual Weapons Development Team (OSD, Paris), Operations Analyst with the Weapons System Evaluation Group, OSD, and his present assignment is Weapon Systems Project Officer on the SHAPE staff.

"Very little has been done so far in designing special weapons for airships, but it is evident that there is much scope for ingenuity here."

R. P. Hearne
in *Aerial Warfare* (1909)

Hearne's thirty-nine year old statement would be relevant today. It furnishes an especially fitting description of the 'state of the art' of U. S. air-to-air weapon development throughout World War II. When VE-

Day arrived, the United States Army Air Forces were still operating with the same Browning machine guns with which they had been equipped in 1941 when the Japanese Navy made its surprise attack on Pearl Harbor, of which the first prototype dates back to 1918.

The analytic review which follows is primarily concerned with the weapons of the air-to-air duels over Germany, with special emphasis on the aerial combats of the U. S. Eighth Air Force bombers versus the *Luftwaffe* fighters. Weapons selection is a critical factor in any form of duel. It is of key importance where destructive firepower plays so decisive a role in the attritional objective of air battles,—a criticality which is not relevant to air attack on surface targets. Ironically enough, in gunnery and rocketry attacks against surface targets, where air-to-air firepower had little effect upon the survival of the attacking fighter, the U. S. weapons were close to the required optimums. The caliber .50 Browning, though below par in the fighter-vs.-bomber duel, was a very effective strafing weapon against ground troops and most of their vehicles. This was particularly so against surface vehicles when firing the World War II armor-piercing incendiary projectile (a new bullet design which was inspired, incidentally, by a Soviet product). In the ground-attack role of air-to-surface rocketry, the U. S. made significant progress. This was, in large measure, the product of the pioneering rocket research teams of Drs. C. N. Hickman and Charles C. Lauritsen.[1] But in air-to-air firepower between American bombers and *Luftwaffe* fighters the U. S. A. A. F. remained behind and deficient while the decisive air war was being waged.

For the first three years of the air war the *Luftwaffe* modestly continued to employ their rifle-caliber (7.9 mm.) machine gun in all their principal fighters. By 1942, however, the G. A. F. fighters' firepower overtook and, subsequently, far surpassed the maximum defensive firepower of our B-17 and B-24 bombers. This held true even under the optimistic assumption that effective attacks would be tail attacks and that in such attacks a total of five bomber guns could be brought to bear simultaneously against a fighter flying a pursuit-course tail attack.

The firepower of *Luftwaffe* fighters continued to expand, and within the next two years the 30 mm. cannon (MK 108) became standard G.A.F. fighter armament. Thereafter, the Eighth Air Force bombers were seriously handicapped when subjected to attack by enemy fighters packing offensively two to three times the relative destructive potential of the defensive firepower carried on our bombers.

In 1945, during the final phase of the war, the heavy bombers were faced by two new *Luftwaffe* fighter weapon systems which made the already one-sided duel almost a hopeless battle insofar as the bomber was concerned. These new threats were: (1) the heavily armed FW-190, and, (2) the introduction of World War II's only high altitude jet aircraft,—the Me-262.

The first really "heavily-armed" fighters were planned by the *Luftwaffe* as early as 1943, and were defined as those having more than five guns,

[1] It is noteworthy that Dr. C. N. Hickman's ingenuity was belatedly accepted by the War Department after the onset of World War II. Dr. Hickman offered the U. S. Army a repeating rocket-launcher system for air-to-air combat in 1918, but no interest was shown in this new weapon system. Similarly, over twenty years elapsed before Hickman's proposal and design of the ground army "Bazooka" received serious consideration.

Characteristics of Aircraft Guns of World War II
1939 - 1945

gun designation	*caliber*	*weight (pounds)*	*length (inches)*	*rate of fire (rounds/minute)*	*muzzle velocity (feet/second)*
			GERMAN		
mg-17	7.9 mm.	27	47½	1200	2476
mg-15	7.9 mm.	16½	42½	1200	2476
mg-81	7.9 mm.	14	35	1500	2312
mg-81Z	twin-mounted	mg-81's		3000	2312
mg-131	13 mm.	47	46	950	2460
mg FF	20 mm.	58	52½	520	1968
mg-151	15 mm.	94	75½	650	2788
mg-151/20	20 mm.	93	69½	650	2319
MK-103	30 mm.	264	92½	420	2362
MK-108	30 mm.	136	42	600	1771
flak 18	37 mm.	590	142½	80	2690
			ALLIED		
Vickers	.303 in.	20	40	950	2450
Browning	.303 in.	23	40	1200	2450
Browning	.30 in.	23	40	1200	2800
Browning	.50 in.	61	57	750	2850
Hispano	20 mm.	102	94	600	2850

at least two of which were to be 30 mm. cannon. The original planned requirement called for an advance model of the FW-190 (with liquid-cooled engine) carrying the following complement of guns:

One—MK 108 (30 mm.) in the engine
Two—MK 108 or four MG 151 (20 mm.) in the wing
Two—MG 151 (20 mm.) in the wing roots
Two—MG 131 (13 mm.) above the engine

In 1944, fighters in this category, with the further addition of heavier defensive armor, were encountered in the skies over Germany in mass line-abreast tail attacks. These saturation tactics, with each fighter selecting an individual bomber target, insured that relative firepower would be unquestionably and devastatingly in favor of the G.A.F.

ME-262 Effectiveness

The most formidable fighter of the war was undoubtedly the Me-262 which, in addition to possessing great superiority in speed, carried a four-gun installation of 30 mm. (MK 108) cannon firing approximately 600 rounds per minute,—comparable to the rate of the Browning caliber .50 machine gun with which our bombers were armed.

A special unit of Me-262's, J.V. 44, was formed in January 1945, with what was the heaviest fighter armament of the war. Their aircraft carried twenty-four 55 mm. (2-inch) high-explosive rockets in addition to the normal four 30 mm. (MK 108) cannon. This special unit made a number of attacks on our bomber formations and achieved some success, due to their great speed and firepower advantage, despite the heavy numerical superiority of our then outmoded fighter escort. Fortunately for the heavy bombers there were usually no more than sixteen of these special Me-262's serviceable for any one mission, with the result that in all these attacks the German force was usually far outnumbered by friendly escort fighters.

In attacking the bombers the Me-262's normally flew in formations of nine aircraft (three elements of three). Because of their great speed no top cover was required. In the attack the formation approached from the rear and covered the whole width of the bomber group in order to split up the defensive fire of bomber guns. At 650 yards, the twenty-four rockets were fired at the single selected bomber target (only one rocket hit was required to destroy either a B-17 or B-24 airplane). Fire was then opened with the four 30 mm. cannon, the aim being at the general shape of the target. A breakaway above the bomber formation was made only after the attacking planes had closed to within 150 yards from the target. These attacks when successfully launched took a high toll from the target formation.

The Eighth Air Force bombers became increasingly inferior to the *Luftwaffe* fighters as those fighters expanded their firepower while the bombers retained their obsolescent .50 caliber guns. They survived the air war only because of their superiority in numbers coupled with the success of their escort fighters in attriting the opposing fighter force. Because of the success of our escort fighter battles, the *Luftwaffe* by the end of 1944 had been reduced to ineffective strength and the remaining elements of the G.A.F., despite their formidable armament, were unable to destroy an appreciable percent of the thousand and more

bombers commonly employed on a single mission.

Planning, as we originally did, that the bomber would be able to penetrate German defenses on a continuing basis at acceptable cost, why did we lag so far behind German technology in air dueling weapons? How did the German Air Force manage to produce such superior weapons, and so rapidly surpass the bomber defensive capability? Was there neglect in armament research and development effort in the United States?

American Focus

The R & D effort applied in the field of U.S.A.A.F. bomber defense systems was, surprisingly enough, appreciable. Numerous productive projects evolved and become operational during the war years. However, this effort was confined almost exclusively to the field of power turrets and sighting equipment. This emphasis on tracking and fire control problems inadvertently lost the firepower race as advances in these fields, while essential, had only a negligible effect on terminal ballistics. The most important single factor, the destructive effect of the projectile at the target, remained practically at a standstill in U. S. armament development throughout the war.[2]

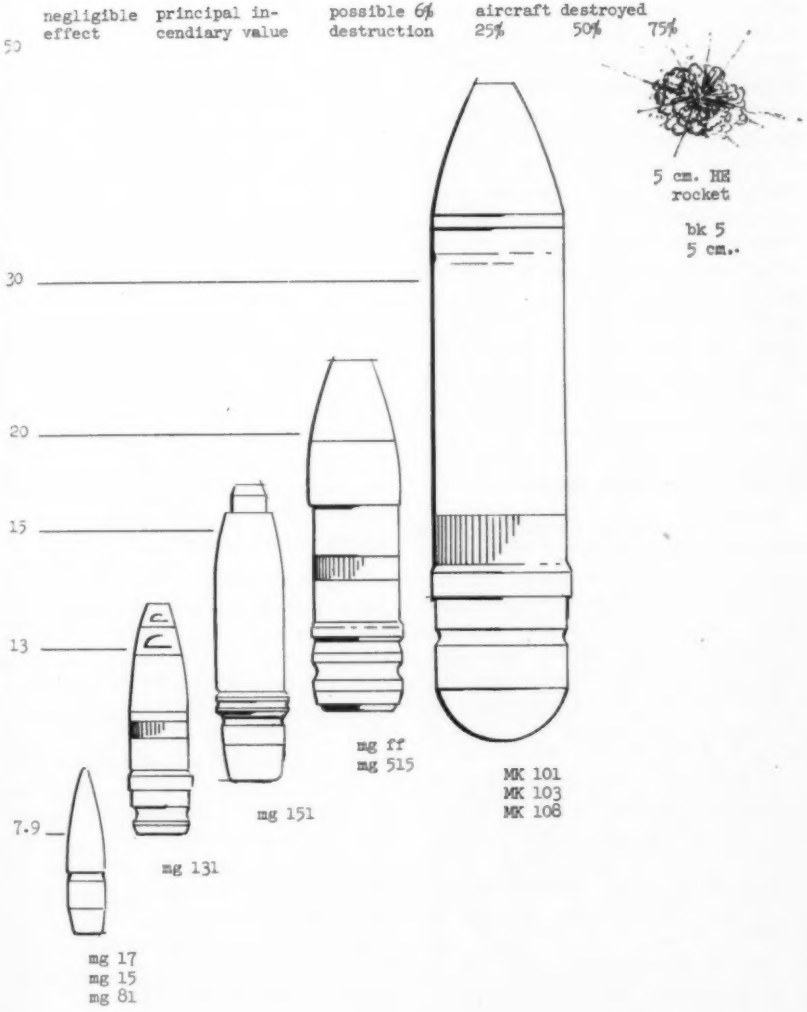
[2] It is interesting to note that the one exception to this stagnant situation was an improvised experimental installation of a rearward-firing 4.5 inch rocket on the B-24 Liberator. This field modification was perfected solely by the staff personnel of the 8th Air Force's 2nd Combat Bomb Wing in England without stateside technical assistance. This tubular launcher was aimable and reloadable in flight, and incorporated a unique optical sighting system. The JCS refusal to release the essential VT-fuze precluded the combat use of this weapon which had the terminal effect of the 105 mm. howitzer. This weapon should have measurably increased the defensive firepower in our four-engine bombers.

The *Luftwaffe's* greatest dividends evolved in the field of projectile design; the very field left unexploited by the U. S. The G.A.F. first, through combat analyses, derived the optimum projectile design and, finally, combined the new projectile with an optimum caliber. These sound wartime decisions must be credited, primarily to their new and very practical approach to combat operational research. This unique program, involving detailed analysis of G.A.F. fighter 16 mm. gun-camera films, was conducted at the Hermann Goering Institute of Aeronautical Research at Brunswick under the leadership of the war-renowned aeroballistic scientist, Dr. Theodor Wilhelm Schmidt.

As with Lanchester's pioneering efforts to "sell" operational research to the U.K. in 1916, Schmidt encountered many great difficulties in "selling" to the *Luftwaffe* his novel approach to the analysis of aerial combats.

As a keen student of the history of ballistics, he had given early recognition to the value of combat photography in his historical studies of the French air combat photos made during World War I. In 1939, Schmidt (at that time 32 years of age) began a one-man campaign to interest the *Luftwaffe* in his views on the analysis of the 16 mm. gun-camera film. Unfortunately for Germany, the Schmidt concept was not fully endorsed until 1942, resulting in a loss of three years of invaluable research data. Even after the belated appreciation of the potential of Schmidt's analytic methods, his analysis group was never adequately staffed and had available only severely limited means for improvised instrumentation. Furthermore, the shortage of gun cameras in the *Luftwaffe* throughout the war prevented Schmidt from ever approaching an

DESTRUCTIVE POTENTIALS OF HITS BY GERMAN AIR FORCE GUNS



optimum scale of coverage. Despite these serious handicaps, Schmidt's analyses of modern air combat have been given world-wide recognition as the most advanced approach to this important air combat problem, and the derived data the most comprehensive of any World War II analyses. Schmidt's data was correlated with the trends in the *Luftwaffe's* numerous experimental combat fighter weapon systems, and gave highly accurate indications of the relative kill probabilities of various calibers and types of armament. This technical guidance led to a rapid evolutionary development in the weapons capabilities of the G.A.F.'s interceptor forces. Postwar analyses in the U. S. by means of extensive ground trials against hundreds of actual aircraft targets only served to give post-mortem confirmation of the wartime knowledge the *Luftwaffe* possessed.

A Schmidt Case-Study

Schmidt's analytic method was to do a careful visual review of the combat gun-camera film, making accurate measurements and the necessary calculations to derive the type data essential to properly guide future operational developments. The basic data extracted from a typical Schmidt analysis is shown in any relevant sample from his multiple files.

A significant analysis was made by Schmidt of an attack made by fighter pilot Vivroux of Sturmstaffel 1 (a unit carrying special heavy defensive armor on all their aircraft). Vivroux was flying a FW-190-A7 near Rostock at 1318 hours on 11 April 1944. He made a tail attack against a B-17 flying at 5300 meters. Vivroux opened fire with his four 20 mm. guns beyond 800 meters, scoring his first hit at a distance of 700 meters. He continued firing until he had reached a point-blank range of 20 meters before breaking off the attack (an unusually short distance for the conventional fighter; but standard procedure for the heavily-armored Sturmstaffel in attacking a target defended only by .50 caliber guns).

The analysis for accuracy and effectiveness was oriented to the preparation of three basic graphs: the first correlated the cinema film frames with distances from the target and indicated actual hits on the bomber; second, an angular graph was drawn to indicate the fighter's variation in angle-off during the attack (in hundreths of a right angle) and correlating film frames with strikes; the third graph was drawn to assess the "aim wander" in the fighter's approach to the bomber target, while a pictorial outline of the target indicated the points of projectile impact. The scientific analysis of these and other related graphs contributed to a progressive improvement in firepower and accuracy of air-to-air weapons employed in the G.A.F.

The belting of the FW-190-A7 was in the following order and proportions: one armor-piercing round, two incendiary rounds, and two special high explosive *mine* rounds. This latter type projectile, the *mine*, was a unique German development. The research and final emphasis on this special projectile was one of the most fruitful results of the guidance furnished by the combat film analysis program. The German *mine* projectile was the only missile designed specifically for maximum destruction of aircraft structures, as opposed to the conventional high-explosive (HE) projectile, used by the Allies in World War II, which incorporated the same general design features and proportions established for ground artillery one hundred years

earlier. This obsolete configuration permitted an HE content of only one-fourth to one-eighth of the true potential capacity. The G.A.F. concept utilized new methods of fabrication, —a deep-drawn, thin-walled steel projectile,—as opposed to the age-old system of boring a proportionally small HE cavity in a solid slug. This high-capacity round, particularly in the 30 mm. size, was the Luftwaffe's principal secret in achieving their high probability of destroying the U.S.A.A.F. heavy bombers with barrel-type fire.

Although propellant capacity, and hence velocity, had to be reduced in proportion to the increased projectile length, it was recognized very early by the Luftwaffe that very few hits ever occurred at extreme (1000 yards) ranges, and that velocity was, therefore, not a critical factor. The Allies, on the other hand, pushed muzzle velocity requirements to the maximum and practically disregarded the question of terminal damage. Wartime interrogations and postwar studies finally confirmed the soundness of the German development concept, as the great majority of kills were shown to have occurred at short ranges (even with the higher muzzle velocities).

Schmidt's combat analyses furnished the basic guidance to the *Luftwaffe's* research and development staff. Valuable data also filtered down to other segments of the G.A.F.; the operational planners, the intelligence department, the logisticians, and the training command. In reviewing the results of these analyses, one cannot help but be impressed with the potential dividends to be gained by a properly established operations research program. The specific gains which were produced through Schmidt's program, — the most advanced in its field,—are even more outstanding when we recognize the handicap under which he labored; a late start, shortages of personnel, and inadequate facilities and equipment.

Looking ahead to possible future conflicts, the importance of a well-staffed and adequately equipped operations analysis group can be readily recognized as an essential peacetime establishment if we are to profit from a fuller effectiveness in the employment of future weapons. There will be no time to "sell" the concept of operations research after the "bell rings." The present-day operations research organization must prepare and conduct the bulk of its potential studies on a prewar basis, recognizing the wide range of possible situations under which weapons may be employed. In anticipation of the many potential weapon and tactical requirements, we can profit greatly if the system has a "built-in" versatility that will place important alternative solutions as "hardware on the shelf" and ready for combat. The first few days in any future war could be decisive.

Editorial Comment

The above paper confines itself primarily to air battles that were waged over Germany between American four-engined bombers and enemy interceptor fighters. It rather convincingly discloses that we did not stay abreast of German advances in firepower or defensive armor in our bombers during the critical period of that contest. Progressively improving defensive firepower to counter enemy advances should have reduced our bomber losses. The potential was present in our proximity fuze, rocket launchers, and larger caliber guns. But even with healthy technological advances in defensive bomber firepower, had we con-

PRINCIPAL GERMAN FIGHTERS AND ARMAMENT

1939

1941

1944

ME 109

two mg 17/7.9

three mg 17/7.9

four mg 17/7.9

two mg 17/7.9
two mg ff/20

two mg 17/7.9
one mg ff/20

two mg 17/7.9
one mg 151/15

two mg 17/7.9
one mg 151/20

two mg 17/7.9
three mg 151/20

two mg 131/13
three mg 151/20

two mg 131/13
one MK 108/30

JU 88

four mg 17/7.9
one mg ff/20

three mg 17/7.9
three mg ff/20
two mg 81/7.9

three mg 17/7.9
three mg ff/20
one mg 131/13

three mg 17/7.9
five mg ff/20
one mg 81z/7.9

six mg 151/20
one mg 131/13

ME 163

two MK 108/30

FW 190

four mg 17/7.9

two mg 17/7.9
two mg 151/20

two mg 17/7.9
two mg 151/20
two mg ff/20

two mg 131/13
four mg 151/20

two mg 131/13
two mg 151/20
two MK 108/30

two mg 131/13
six mg 151/20

two mg 131/13
two mg 151/20
four MK 108/30

ME 110

four mg 17/7.9
two mg ff/20
one mg 15/7.9

four mg 17/7.9
one MK 101/30
one mg 15/7.9

four mg 17/7.9
two mg 151/20
one mg 81z/7.9

four rp's HE 21cm
four mg 151/20
one mg 81z/7.9

four mg 17/79
four mg 151/ 20
one mg 81z/7.9

two MK 108/30
two mg 151/20
two mg ff/20
one mf 81z/7.9

two MK 108/30
one flak 18/37
one mg 81z/7.9

ME 262

four MK 108/30

ME 410

two mg 151/20
two mg 17/7.9
two mg 131/13

six mg 151/20
two mg 131/13

four mg 151/20
two mg 151/15
two mg 131/13

four rps HE 21cm
two mg 151/20
two mg 17/7.9
two mg 131/13

four mg 151/20
two mg 17/7.9
two mg 131/13

two MK 108/30
two mg 151/20
two mg 17/7.9
two mg 131/13

one bk 5
two mg 151/20
two mg 17/7.9
two mg 131/13

tinued our bomber operations under the initial assumption that the bombers, without fighter escort, could penetrate enemy air defenses to their maximum operating radius on a sustaining basis the bomber-fighter duel would inevitably have gone against us. This, to our good fortune, was convincingly demonstrated in the early piecemeal commitment of our bombers, escorted on occasion by a token fighter force, inadequate in numbers and inadequate in range.

But the bomber-fighter duel was not the critical and deciding issue in the overall air war that was fought over enemy terrain. When U. S. fighters belatedly arrived in the theater and the vitiating shackles of close escort for bomber formations had been removed and initiative in action thereby restored to our fighters, the major and deciding issue immediately became a fighter-versus-fighter contest. In this contest our high velocity .50 caliber machine gun retained a high degree of effectiveness, approaching optimum value, when the target was an opposing fighter craft.

That the enemy did not sense the criticality of this issue is readily disclosed in the provisions he made for expanding his firepower against the bomber target, without apparent concern that these provisions were compromising fighter combat features. With each advance in his firepower against bombers he added weight to his fighter craft which reduced their power to maneuver in fighter-versus-fighter duels,—a critical factor where gun sights must be brought to bear for firepower to have meaning in the contest. In his conventional fighters, the Me-109 and FW-190, he tailored combat inferiority into his weapons for the fighter-versus-fighter battles to gain a superiority in interceptor fighter-versus-bomber duels. This compromise with fighter-versus-fighter factors was only one of many enemy bungles, but it cost him dearly. It paved the way for the decisive and conclusive air victory we ultimately gained. Had he first adequately provided force to effectively oppose our penetrating fighters and then, with any industrial resources remaining, built some bomber killers their profits should have run disturbingly high. From hindsight we can get some comfort from the fact that he didn't sense the nature of the war he was fighting and did not provide either the type or size of force it demanded. Responding to the values, doctrine and patterns of two-dimensional warfare he warped his air force structure and aborted from the demanding objectives in this new, and therefore strange, category of conflict. This warping was not exclusively one-sided.

The jet-powered Me-262 restored superiority in two combat features that the enemy had voluntarily yielded in his conventional fighter craft. It possessed unique superiority in speed and firepower, against which our bombers were no match. But it had its Achilles' heel; its range was short and its bases were limited and highly vulnerable to capping operations by our penetrating fighters. By assigning a flight of P-51's to cap each of his usable bases, the Me-262, when running low on fuel, could only land at suicidal cost. As he glided in for his landing his superior speed and firepower lost meaning, and he took on the target features of a sitting duck. If he had sufficient fuel he could move on to an alternate field, —to find a similar fate awaiting. Many resorted to open-field crash-landings with the landing gear up which, in terms of time, approximated the value of a kill.

A curious reader will wonder why

the Me-262 did not employ his superior speed and firepower to defeat and destroy these base capping fighters. He did, only to find that the very maneuverable P-51, under the control of a well-qualified pilot, was highly elusive as a target which could and did deliver stinging retaliatory fire. Then, too, the Me-262 seldom had sufficient fuel to fight an extended battle in terms of time,—a crash-landing was his profit if he remained around too long. It was these tactics by outmoded propeller driven fighters that stunted the growth of the Me-262 and nullified its potential strategic threat. We can, and should, take comfort from the fact that our fighter pilots, skilled in the tactics and techniques of air combat, were thinkers too. They sensed the unique problem posed by the enemy introduction of the jet-powered Me-262 into the air war and they soundly solved it. In so doing they tempered down, but couldn't remove, the fast growing quandary in the minds of our strategic planners, who were seeing the Me-262 as quickly negating all our former gains and restoring air domination to the foe.

Restricted to surface thinking, and its values, they could reach but one solution,—the rapid capture from the ground of the enemy's air bases. Operating against Germany's debilitated air and surface forces these surface operations were feasible with minimum hazard and reasonable cost. To have conducted them against opposing air domination and a significant air force strength to exploit it would have been a unique military experience that had yet to have initial test,—and the probabilities are expanding that the test will never be made.

Had the bombers been permitted to complement the fighters in their battle with the Me-262's, which were coming off the production line in ever-increasing numbers, the contest would have been short, decisive and lasting. An attack against the underground engine production establishment, which was the exclusive source of their jet engines and which was singularly vulnerable to a combination napalm-incendiary attack (an attack which had been fully planned), would have decisively crippled that production line. Successive attacks on that and related targets would have reduced production to a strategically meaningless dribble. Higher priority targets precluded this solution to the jet fighter menace so escort fighters had to carry the load while the bombers were on other tasks, but they carried it well.

The defeat of the German *Luftwaffe* will be treated more fully in succeeding issues.

O.A.A.

THE BATTLE WITH OBSOLESCENCE

"It is a dangerous fallacy to assume that missiles once built can be stacked up like so much cordwood until needed. Missile systems are extremely complicated and the missiles can wear out simply by standing idle."

—Dr. George E. Valley, Jr., USAF Chief Scientist, at the Air Force Association Jet Age Conference, February, 1958.

SQUARDON OFFICER SCHOOL

By COLONEL ROBERT J. LOUGHRY, USAF

The value of officer education in the United States Air Force can only be measured in terms of service to the nation. The manner in which each individual officer interprets his Oath of Office obligation influences his understanding, acceptance and ultimate action regarding his assigned responsibilities. Thus, the goal of officer education is to provide an opportunity for officers to develop towards maximum efficiency in discharging their responsibilities to the United States.

In the past decade Air Force officers have had to relate airpower to national conditions varying from uneasy peace to partial war. For the foreseeable future, world conditions can hardly be expected to improve. Therefore, each officer must possess the knowledge, understanding and skills necessary for him to fully meet his responsibilities. Not only must he be highly proficient in human relations, communication, problem solving, staff techniques, leadership and command, but he must also learn to solve the increasingly complex problems involved in developing and employing airpower under various degrees of conflict.

His education is a continuing process. Much of it occurs before commissioning, yet each subsequent lesson better prepares him to carry out his responsibilities. Much of his education occurs informally in field units, where isolated everyday air force truths are learned. But, as in any profession, probably the greatest learning takes place in formal courses of instruction which synthesize doctrine, concepts and principles and correlate them to the learner's experience.

The Squadron Officer School of the Air Command and Staff College, Air University, conducts such a course. The first level of the general service schools of the United States Air Force, the Squadron Officer School is commanded by Colonel Robert J. Loughry. As Commandant his duty is to provide professional education for squadron grade officers entering the school for fourteen weeks, three times a year, from all Zone of Interior major commands.

Colonel Loughry, a 1939 graduate of Dartmouth College where he majored in Business Administration, entered the Army Air Corps in 1941. Graduating from flying school as a pilot in 1942, he was commissioned a second lieutenant. He served in the training command and later joined the 464th Bombardment Group in Italy where he flew B-24's and served as Operations Officer until 1945. From 1945 to 1951 he served in various Air Transport Command positions with units in the United States and overseas; he also graduated from the Command and Staff School, Class 49-A. During a tour in the Pentagon from 1951-1954, his duties with the Directorate of Operations as an Operations Staff Officer and B-47 Project Officer gave him invaluable staff experience. He returned to Europe in 1954, where he commanded operational tactical fighter units.

The beginnings of the Squadron Officer School lie in the Air Service Tactical School, later renamed the Air Corps Tactical School, of pre-World War II days. Operated under the general supervision of the G-3 of the War Department General Staff, the Air Corps Tactical School was directly responsible to the Chief, Army Air Corps. Located at Langley Field, Virginia, this school like most Army service schools operated largely as an independent unit with little coordination of scope or doctrine with the schools of the other arms and services. It fortunately developed and taught the air doctrine, concepts, strategy and tactics with which we fought World War II successfully. However, war levies absorbed the faculty and students and the school was suspended.

Reactivation

After 1945, General Spaatz, then Commanding General of the Army Air Forces, directed that the Air Tactical School be opened at Tyndall Field, Florida. This school continued to fill the need for a junior general service school after the United States Air Force became a separate service in 1947. Beginning under the auspices of General Muir S. Fairchild, founder of the Air University, the Air Tactical School remained at Tyndall Field until 1950 when it was transferred to the parent command base at Maxwell Air Force Base, Alabama.

In 1946, the professional Air Force discerned some semblance of order emerge from the chaotic conditions caused by mobilization, war, and a pressured demobilization. Air Force planners looked forward to the years ahead. Tempered on the one hand by frustrating pre-World War II service attitudes from within and on the other hand by related though short-lived public acceptance and understanding from without, these men designed the Air Force professional educational system. Although not educators by their own admission, they were determined to build a professional education system which would insure that Air Force officers were afforded the opportunity to analyze the mistakes of the past and strive to develop airpower and its maximum potential for the future. These men who planned had proved their theories of war. But their experience had pointedly driven home the fact that their lost comrades had more often been shot down by inter-service bickering, military ignorance, service apathy, shortsightedness, and traditional thinking than by superior enemy weapons or tactics. Their apprehension for the future of airpower can be seen in their choice of a motto for the Air University: *Proficimus More Irretenti*. It could be seen in the now defunct Squadron Officer Course motto: *Think or Die*. Their foresight and judgment provided a solid foundation upon which the philosophy of the educational system rests firmly today.

Their aims for officer education were high, and many of these objectives are still current. Their thinking dealt with a force structure of 40 groups comprised of some 62,000 officers of which just over 7,000 were Regular officers. They planned a 3,000 annual student load for the Air Tactical School, 1,000 for the Command and Staff School, 300 for the Air War College and 1,200 for the Air Special Staff School. For the Air Tactical School they planned three fifteen-week classes a year with 1,000 students each class. However, for various internal and external reasons, not the least of which was the major air commanders' reluctance to fill school quotas, the 1,000-man class quota was not met.

The general aims, as the planners saw them in 1946, were to fit officers to carry out their future responsibilities as commanders in war; to create modern air doctrine; and to keep air doctrine current in view of technological developments and changing world situations. They were convinced that the materials provided the student should broaden his understanding and increase his ability rather than merely indoctrinate or train him in a narrow field. A very real problem here was to teach the currently standard doctrine and to indoctrinate the student in standard practices and techniques, yet at the same time guard against stifling academic freedom so that air doctrine would not become traditional, remain stagnant and be perpetuated. Rather than lean on past achievements, their thinking projected coveted ideals into an uncertain future.

Resolution of the Problem

A quick review of the Air Tactical School shows that student learning concerned the faculty more than any other single factor. This was especially important because the students were trained during the war for specialized duties, but lacked any common background of educational experience. Indeed, to overcome this deficiency the Air University was created. Currently the dissimilar training backgrounds of junior officers again plagues the Air Force.

The stated mission of the Air Tactical School was to prepare officers for the command of squadrons and for staff duties appropriate to the squadron grade. The outcomes favored basic principles and fundamentals applied by competent squadron commanders to achieve effective squadron and group performance. Lessor degrees of learning were expected in those subjects that merely broadened the student or stimulated his thinking. Nevertheless, the faculty drew a firm line between training and education even though a cursory glance at subject matter might indicate a predominace of training materials. For example, since a tactical control system, consisting of the latest radar control equipment, operated as part of the school, one might seize on this as training. Actually, in the context of the time period, materials presented in this area were more an indoctrination in advanced technique and can be compared to our present instruction in ballistic missiles.

Within its primary aims of indoctrinating and educating the student, the school encompassed four curriculum objectives. They were to indoctrinate him with command and staff methods and practices current in squadrons, to educate him to solve problems logically, to stimulate him to broaden himself through self-education and to educate him in airpower fundamentals. The faculty taught the curriculum following a blocked schedule according to the following pattern.

The school organization was divided into six major divisions, most of which had specialty sub-sections. First, the student heard lectures presented by the Military Management Division. This division dealt with subjects such as squadron administration, military law, the tools of the commander, and staff organization. The Seminar Division taught oral expression, logical thinking, and systematic problem solving. In the New Development Division future combat aircraft, weapons, and their supporting equipment were briefed. The Supply and Services Division presented lectures pertinent to these fields, while the Operational Services Division, made up of four

sub-sections, presented the operations, communications, intelligence and weather areas. Lastly, the Tactics Division gave lectures and held exercises dealing with the combat air commands and the Army and Navy. One must admit that these subjects should have created a desire to learn on the part of the student.

A sound indicator of the stress laid on learning subject matter can be found in the evaluation system. Students were tested frequently and cumulative scores were arranged on a T-score scale and posted conspicuously. Competition among the students was insured since a student's final rating depended on his class standing. Since the majority of these officers held Regular Air Force commissions a poor overall standing would be a career detriment. Further, only the top 20 per cent would be recommended for further professional education. As a result, studying for grades became more and more an accepted practice and one which the Air University's Annual Board of Visitors, a group of prominent civilian educators and businessmen, frequently deplored. In spite of the questionable method, there appeared to be sufficient reason to continue the practice based on effective learning results.

It had been the intent of the Air Tactical School planners to educate all Regular Air Force officers early in their careers. As these officers advanced in rank and experience, the planners intended to selectively educate only the most promising. The eligibility criteria for the Tactical School reflected these aims. Out of a yearly quota of 3,000 lieutenants and captains, only 900 would be selected from Reserve components. None of the officers selected could have less than one nor more than five years active federal commissioned service. In their annual briefings to the Board of Visitors, the staff continually reiterated that only Regular officers should attend. This became more critical when in 1947 another large Regular augmentation occurred. Consequently, their goal of having all Regular officers attend the Air Tactical School seemed more remote.

Had they but known their careful plan would be further knocked askew in 1950, their apprehensions concerning the task facing professional education would have increased.

New Concept—New Location

On 23 October 1950, the Squadron Officer Course under the direction of Colonel Russell V. Ritchey began Class 50-A with 205 students enrolled. The difficulties facing him and his staff must have seemed insurmountable. Not only had the Air Tactical School been closed, but an entirely revised curriculum had been dictated by the recall of Reservists for Korea. Almost overnight Tyndall was transferred to the Air Training Command, the Strategic Air Command asked that a special Air Police Training School be established at Tyndall to train security forces, and the Squadron Officer Course was moved to Maxwell.

In the best tradition of the school which taught problem solving as a guiding principle, the demands on the staff were satisfied and the school opened at Maxwell on schedule. Short of qualified personnel (part of the staff and faculty remained as cadre for the Air Police School), on an unfamiliar base, short of educational supplies and equipment, and working in a physical plant not only limited in capacity but also in poor condition, the school began classes in an unheated auditorium.

In 1950 the mission of the Squad-

ron Officer School was to "prepare the student officer for the command of a squadron, and for staff duties appropriate to his grade." The mission statement and objectives failed to mention that the accelerated course aimed directly towards preparing the officer to assume his leadership role in combat. Colonel Ritchey, while briefing his curriculum planners in September 1950 said, "This course which you are about to work upon (is) primarily a war course. Every word you write, every directive, every outline and every problem you prepare must bear upon that idea." Thus, from the very fact that the course began under the external pressures of war, an impetus was evident for concentrating a myriad of learning experiences, both real and vicarious, into a relatively short period of time.

Although the curriculum of the Squadron Officer Course when compared to the Air Tactical School shows only minor innovations, several trends were immediately evident. First, the pace of instruction had been increased. The Air Tactical School's 15-week, 395-hour curriculum was presented at a relatively slow rate. In the six Squadron Officer Course classes each year, 283 curriculum hours were presented in eight weeks.

Both courses taught written and oral expression, problem solving, and staff instruction, with emphasis on squadron fundamentals, as well as the details of activating, training, moving and employing air units. One marked difference in the new school's curriculum was the importance placed on world affairs. While directing that this motivational area be included in the curriculum planning, Colonel Ritchey said, "*Remember* that it is world affairs which has gotten this officer into this school. He, therefore, has a right and a need to know why he is here and where he fits in this great picture. He must know what is expected of him and how he can best do his job. If he is oriented and motivated he will want to do his best job."

The third trend was a shift in instructional methods. The Air Tactical School favored the lecture method while the Squadron Officer Course instruction was almost evenly divided between lecture and small group activities. The latter trend almost completely changed the philosophy and organization of the school.

As the emphasis on small group (first called "tutorials" and later "sections") activities increased, the greater control over the effectiveness of instruction allowed a wider choice of methods to present specific subjects. With the lecture method, variations were limited to straight or multiple lectures, skits and demonstrations. With the section method greater student participation was possible and learning could occur under varying, closely monitored circumstances. Discussions could be held with either the tutorial instructor or the student leading and these discussions could be designed as exploratory, problem solving, or staff exercises. Further, section gatherings could be held indoors for theoretical situations or outdoors for practical application. Thus, the principles, concepts and facts presented from the lecture platform could be discussed, analyzed and, at times, tested during the section meeting. The advantages of this method over lecturing were unquestioned.

Not only did the faculty gain greater flexibility in methodology, but greater attention could be given to individual student questions and problems. Through daily contact with each student the instructor quickly learned

student strengths and weaknesses and could guide the student toward maximum exploitation of his capabilities. Naturally, in the short time allotted for the course, the instructor's ability and the student's willingness and ability to absorb and apply the instruction determined the overall merit of the method. However, as the tutorial method gained momentum, greater emphasis centered on subjectively evaluating student performance and on counseling. Today these characteristics remain integral parts in the school philosophy.

Physical Conditioning Program

Also, as a direct result of the close faculty-student contact, the emphasis on combat orientation, and the physical condition and mental attitudes desired in the students, a closely supervised, rigorous physical conditioning program was inaugurated. This program recognized that not only were the student officers the potential combat leaders of the Air Force, but they were also the men who would ultimately fight the air battles. They came in direct, daily contact with the majority of airmen performing or supporting the combat missions and were, therefore, keys to mission success. As such, their education would of necessity become and remain combat oriented. Consequently, the broad aims of the physical conditioning program were geared to enhance aggressiveness, dedication, the will to win, personal courage, and emotional control under stress. The program also served as an outdoor laboratory for testing, analyzing and evaluating student leadership ability. Placing the sections in competition with each other pointed out in a very practical sense the hard-to-learn values of unit esprit, teamwork, organization and sound human relations. And if these direct outcomes were not sufficient the side benefits were equally impressive. As the student's physical condition improved he was noticeably more alert and confident. Too, after being daily couped up in classrooms and subjected to mental frustrations, the physical activity dissipated pent-up emotions and pressures built up by the demanding schedules. No less important was the steady incident decline in the student dormitories, officers' club and local amusement centers. Today this vital program still serves to achieve the school outcomes and is aligned with current Air Force policy which recognizes the importance of sound physical conditioning to the efficient performance of the Air Force mission.

Project X

Another part of the field leadership program begun late in 1951 is Project X. This activity is a series of 12 practical outdoor problems which can only be solved by small group effort. The project is used to measure the effectiveness of the systematic problem-solving techniques taught in the classrooms and the ability of the students to think, communicate and cooperate as a team. All students participate in the exercise as leaders, problem solvers, and evaluators. Originally used by the Germans and British Air Forces to train flying officers, the project provides the Squadron Officer School another outdoor leadership laboratory. Essentially, the tasks are the same today as they were when originally designed except minor modifications resulted when the precommissioning school at Lackland developed a similar project.

Although several other field leadership programs have been used in the

curriculum, most of them have been discarded except Tiger Trek. These experiments were mostly night problems of which the most notable was the Air Base Defense Exercise developed in 1954 after the Air Force assumed responsibility from the Army for base defense. The school designed the program as a vehicle to teach and illustrate the value and use of estimates, plans and orders; it also provided outcomes in leadership and the details of base defense. As a continuous exercise combining both theoretical and practical application of instruction, it isolated 200 students for two weeks from the main base complex. The two-week function culminated in Tiger Trek. However, the Air Base Defense was discarded after a year's operation as a result of decreased emphasis on the importance of base defense planning and other factors. Tiger Trek, now referred to as Project Z, continued as a night escape and evasion problem. It also had many secondary outcomes including the evaluation of field leadership techniques. This problem initially had four phases—capture and search, escape, evasion and interrogation. In the first phase, an attempt was made to build up emotional pressure in the students to motivate them to escape and evade. The escape phase was prearranged and for all intents and purposes the students were automatically released in unknown surroundings with minimum guidance but with specific objectives to attain. As they evaded through simulated underground stations, they were harassed and the careless ones were captured. From these unfortunates, interrogation teams attempted to reconstruct the details of the four phases before all the students had completed the problem. Since the Code of Conduct training has centralized responsibility for escape and evasion training, this theme has been discarded. However, the vehicle still serves as a night leadership problem, which will not be discussed in any detail for practical reasons.

Dining-In Night

Although the Squadron Officer School is well known for leadership development, one function it helped spread throughout the Air Force is the Dining-In Ceremony. This ceremony, an outgrowth from General Henry H. Arnold's "Wing-Ding," came into being to dramatize the important role of tradition within the Air Force. It is a social activity which gathers a unit together in a formal atmosphere for dinner and good fellowship. During the ceremony, new members are introduced to the unit, unit achievements are recalled and individuals who have distinguished themselves are recognized. Usually a distinguished visitor addresses the assembly, and his talk provides inspiration to the group. Each student participates in one Dining-In during the course. Each year the staff and faculty hold two additional ceremonies of their own. The extent to which this function has spread is readily apparent from the number of requests received by the faculty to speak at these ceremonies in operational units. The Dining-In is an excellent example of the importance placed on an officer being not only a combat leader but a confident, poised gentleman in social situations.

So far the school emphasis on developing proper attitudes, sound physical conditioning, leadership and social competence has been reviewed. By far, the greatest emphasis lies in developing the students' mental ability.

As in the Air Tactical School, the school today seeks to educate junior

officers early in their career to prepare them for greater responsibility. The present mission is to increase the abilities of selected officers to execute the command tasks associated with squadrons and to perform staff tasks normally encountered by lieutenants and captains. The same four objectives of the Air Tactical School, squadron duties and responsibilities, problem solving and communication, airpower, and continued professional development, have been augmented with a leadership objective. The basic aim of educating rather than training remains, although the student becomes indoctrinated in the new developments subarea of airpower.

Evaluation Program

Direct evidence of how sound a school's curriculum is and how well the objectives and outcomes are achieved can be found realistically through its evaluation process. When the Squadron Officer Course began, little attention was focused on evaluating student performance. As the school developed, the need for analyzing student progress became more apparent. By 1954 when the school had been increased to 14 weeks, the evaluation program had reached into almost every facet of student activity. Six instruments used to report on student performance alone were objective

Credit.: U. S. Air Force

Just as in the other major schools of the Air University, students in the SOS body are divided into small groups or seminars to discuss problems and to exchange ideas. Informality of this sort allows for greater freedom of thought and expression.

Credit.: U. S. Air Force

Squadron Officer School students are judged, in one phase of their education in the Air University school, on their ability to solve special field problems, designed specifically to determine leadership abilities and characteristics.

multiple choice tests, essay examinations, graded written assignments, graded speeches, student performance profiles and Peer Rating Reports. In all, the faculty used twelve separate grades in academic performance. Four were objective and eight were subjective. In addition to the Peer Reports, the instructor rated each student twice on the performance profile in such areas as leadership, attitude, initiative and cooperation. On the other hand, the effectiveness of instruction from a curriculum viewpoint suffered no less scrutiny.

Through pre/post tests, faculty monitor reports, scheduled student and faculty critiques and graduate questionnaires, the school kept a constant check on course content. Because the student and curriculum were monitored closely, tendencies toward poor student per-

formance or below standard instruction, faculty methods or inaccurate data were countered. Although no fixed percentage of students had to fail the course, some eliminations occurred because of poor academic performance, poor attitude or unacceptable conduct. Overall, the evaluation system is both fair to the student and aids the school mission in a superior manner. Except for the Air Force Training Report replacing the Officer Effectiveness Report, the evaluation program today remains the same.

Ever-Changing Features

Since 1954 the characteristics of the student attending the Squadron Officer School has gradually changed. Generally, these changes have reflected Air Staff efforts to realign the professional education system to officer population grade structure and length of service.

Soon after the Korean War it became apparent that a large permanent Air Force in-being manned by professional airmen would be required for an indefinite period. A board of officers saw the need for the educational system to shift to a lower gear for the long haul ahead. The Squadron Officer Course had been lengthened from eight to nine weeks in 1952 and then to ten weeks in 1953. During the fall of 1954, the Squadron Officer Course became the Squadron Officer School as a result of a major reorganization within the Air Command and Staff College. Class 54-B became the first 14-week class and experienced many other significant changes.

Eligibility Criteria

The eligibility criteria reflected a new emphasis. Previously, the first three officer grades attended the school under the one to six active federal commissioned service rule. Second lieutenants became ineligible when the rule was changed to at least three but not more than eight years federal commissioned service. On the other end, thousands of Reserve officers became ineligible when both active and inactive service counted in determining years of service. A survey of Class 54-C showed that the average Reserve captain in resident had nine years, ten months total commissioned service, while the average Reserve lieutenant had five years, eight months. Of this time, the captains had served five years and seven months on active duty, while the lieutenants had served three years and four months. Thus, 206 of 251 captains and 114 of 390 lieutenants were ineligible under the new rules. In addition, 80 lieutenants did not meet the three year minimum. The ruling had no effect on Class 54-C, but the fact that two-thirds of the class failed to meet the new criterion indicated significant trends.

A statistical analysis of Class 54-C indicated a profile of the average student. He was 31.7 years of age, came from ATC, SAC, ADC, or TAC, and was a rated Reserve pilot. Only 12 per cent of the class were regular officers. Just as important, only 27 per cent had a college degree. Although this figure might appear low, in the first class of the Air Tactical School only 13.5 per cent of the students had attended college. Over 74 per cent of Class 54-C had obtained college credits ranging from one semester to a Doctor's degree.

The importance of the junior professional military school of the Air Force would be incomplete without an analysis of its future. Since a recent change in criteria for attending the school reflects current Air Force plan-

ning, these criteria and their impact should be reviewed. The recent large increase of Regular officers from 25,000 to almost 50,000 out of a total officer force of 128,000 officers will certainly have an impact on the school. Certain background training leading to an Air Force commission affects the school. Finally, no objective history of the Squadron Officer School would be complete without mentioning a few of the more critical problems it has.

The latest change in criteria during 1958 further restricted officer eligibles. Permanent first lieutenants or temporary captains with not less than three nor more than seven years promotion list service for Regulars or total federal commissioned service for Reservists are the new criteria. These rules logically restrict officers who have not yet decided to seek an Air Force career. Since we presently have more career officers to educate than can possibly pass through the resident course, the minimum of three years rule shuts out officers with a date of separation. The seven year rule provides for an acceptable cut-off point beyond which questionable value to the officer or the Air Force results. Career officers beyond the zone have probably progressed beyond the level at which the education could be used most effectively. The rule allowing only permanent lieutenants and temporary captains stresses the importance placed on educating the Regular force. By the same logic, allowing Reservists to attend recognizes that there is no way to determine which Reserve officers passing through the school eligibility zone will eventually be integrated. The major factor in this area hinges on force stability. Large force reductions or expansions would cause subsequent changes in eligibility criteria. However, one partial solution to the problem of officer education is the recent requirement that after July 1959 all junior officers must either attend the Squadron Officer School in residence or take the course through correspondence.

The goal of educating all Regular officers has not been abandoned. Yet, certain obvious limitations preclude many of these officers from attending general service schools progressively. In the first place, there are too many officers for the limited educational facilities afforded. The goal of 3,000 officers annually attending the junior school has not been reached. Present plans, through exchange of facilities and reducing quotas in the Command and Staff School, call for the Squadron Officer School to reach 1,000-man classes prior to 1960. Since only a total of 18,000 officers have graduated from the resident course, present manning figures indicate it would require three years to educate the Regular permanent first lieutenants alone. It would take ten years for all Regular officers with the rank of captain or below to go through. The disheartening conclusions to be drawn are that not only will many officers be denied entrance to the school, but many of those selected will not attend a general service school beyond the junior level. Another conclusion which vitally effects the school curriculum is that on the one hand the curriculum must provide a solid foundation for those officers who will progress to the intermediate level and on the other it must provide terminal learning to span the Air Force career of those who will not attend a higher level course. For both these groups the curriculum must provide a basic understanding of the technological developments of the last decade and their future impact on the Air Force and the nation.

The Standardization Problem

A disturbing problem long recognized by the Air Force is the apparent lack of standardization in officer military schools which lead to officer commissioning. The report of the USAF Educational Conference of 1956 states, "These differences in backgrounds among young officers who come from different pre-commissioning schools create problems later in the professional education of the officer corps." An analysis of Class 58-C shows that out of 790 students, only four per cent are graduates of service academies, 46 per cent are aviation cadet graduates, 36 per cent were commissioned through AFROTC, ten per cent are OCS graduates and four per cent received direct commissions. Fifty-five per cent hold baccalaureate or higher degrees, while 87 per cent have attended college at one time or another. The concern to the Squadron Officer School from these factors lies here. The students have, from their past training, experienced fluctuating attitudes toward rank, duty, discipline, dedication, esprit and military tradition standards. A fact which compounds this problem is that their seniors in the field were denied adequate basic military training through no fault of their own. Some senior officers maintain this was the result of rejecting some of the military fundamentals taught by the Army as the Air Force struggled to become a separate service. A more measurable factor—the wartime expansion with all its disadvantages including reduced officer training periods and primary emphasis on producing combat crew members—will haunt Air Force planners and leaders for many decades.

What has this to do with officer education? For one thing, the professional school finds itself too often providing remedies for deficiencies in officer training. For another, it spends an alarming amount of time in remedial or corrective action for elemental deficiencies in writing, reading, speech and logical thinking skills. It must, of necessity, expend more effort in counseling the weaker student than it spends on inspiring and guiding the outstanding one. The dual responsibility for solving this problem lies squarely with the school and with the field commanders. Under the present selection system, the burden of selecting the best qualified junior officer for further schooling falls on the unit commander. Undoubtedly, he is the most qualified person to make the selection. Yet, he usually does not know how apt a student his selectee will be. Some apparently necessary guidance could be made available to the commander were the Air Force to adopt some form of testing device for the various professional school levels.

If the assumption that the United States would circumnavigate the schools of war for the next decade could be accepted, the stability thus enjoyed by the officer corps would be extremely beneficial to the Air Force professional education system. Regardless, the Squadron Officer School has exerted a strong influence on the professional ability of the officer corps. If war comes, I am equally certain that the education of the school's graduates will show a solid return to the United States Air Force in combat effectiveness. For those of us charged with the responsibility of educating the future commanders of the Air Force, one challenge among many willed to us by the combat tempered Air University founders must be met. Air doctrine and the strategy and tactics it supports must never be reduced to dogma—it must remain dynamic.

WHAT USE IS HISTORY?

A CONCEPT FROM THE ROYAL BANK OF CANADA

"Take from the altars of the past the fire—not the ashes." In this elegant pronouncement by Jean Jaurés, the French statesman, philosopher and orator, is epitomized the purpose and philosophy motivating the editorial policy of The Air Power Historian.

The article that follows openly features a similar endorsement. It is the essence of a monthly letter published and circulated by The Royal Bank of Canada. Because it expresses in simple but comprehensive language the purpose we serve in our historical program, we are happy to bring its thesis to our readers.

Not all of us agree about the benefit to be had from studying the past. People who believe its experiences should be used today and passed along in trust to their successors rub elbows with those who think that tradition and precedent are a ball and chain hindering progress.

What a pity it is that this should be so! The vital beliefs and good practices of our western world rest on the fulcrum of historic knowledge. There is no basis for our society save its past. There is no guide to business decisions except that given by experience. There is no personal maturity that is not built upon reflection on events of yesterday.

The record of things to be recalled is contained in books, in the minds of parents, in universities, and in business files. What are books but the thoughts of men of their time put down in type? What has a university to proffer except what it has absorbed of the past, to be communicated to every new generation with interpretation and adaptation? What has any mother to pass on to her children except the accumulated wisdom of mothers of the past and the lessons of her own experience? What is the purpose of all our office work from the clay tablets of Babylon to the punched tape of today's electronic machines except to provide the history of transactions?

There is one qualification to be made: we must use only what is true, significant, and applicable. We must, as Jean Jaurés, French statesman, philosopher and orator said it: "take from the altars of the past the fire—not the ashes."

Our Debt to the Past

We may be disappointed by the apparently small social progress we have made. We may think that the advancement has not lived up to our opportunities. Dr. W. F. Collier's *Outlines of General History*, published at Edinburgh in 1868, has as its first chapter heading: "Adam to Babel". We may comment cynically that no further chapters are needed because we have not yet progressed past the age of confused talk.

But the extent of our success or failure does not affect the necessity we are under to use any possible means to keep our balance in these slippery days. We are always coming up against the emphatic facts of history in our private, business and national experience. When we can pluck an example from the past and use it to help us today that is a very practical use of history.

Even fables and stories have their uses. One after another we come face to face in our life's adventures with every fable of Aesop, of Homer, of Chaucer, of Scott, and verify them with our own heads and hands.

All the fictions of the Middle Ages, that seeming pause between about 500 A.D. and the revival of learning toward the end of the 15th century, reveal themselves as masked expressions of what the minds of people toiled to achieve. Their magic stories may appear childish to us, fit only for juvenile story books, but only because our science has made their fantasies come true: the shoes of swiftness, the power of subduing the elements, of using the secret virtues of minerals, of speaking across continents, of sailing over mountains and seas on magic carpets.

We are forever indebted to the past. It is the source of our very identity. In the present moment, which changes as we live it, the past is all we know.

Our Forefathers

By telling us what our forefathers did, history inspires us in two directions: to respect their achievements, great in their day, and to strive to equal their resourcefulness and courage.

Children take many things for granted. They do not marvel over automobiles, airplanes, radio, television, the telephone. Many things seem to us very simple because someone ages ago or a half century ago was clever enough to think of them.

It would be a healthy custom to pause, every once in a while, to pay a memory tribute to the explorers and inventors, the enterprisers and the artisans and the farmers, who laid the foundation of our prosperity. They blazed trails through the forest and over mountains, trails which we have widened into highways and along which we have laid railway tracks. They paddled their canoes along unknown rivers and lakes where we have developed a seaway. Their deeds inspire us not to allow the active bravery of the first rough age of America to change into a passive acceptance of benefits.

Beyond our ancestors of the past two or three centuries stretches a line of people who were already old as nations, who were already wealthy and civilized, when our domain was inhabited by stone-age hunters.

We have all those past ages open to us. Everything is in our history to tell us how we arrived at today's comforts and sorrows: the efforts, actions and sufferings which wrung our civilization and culture out of chaos.

That is one use of history. It is the record of societies of men and women, of the changes which those societies passed through, of the ideas which determined their actions, and of the material conditions and forces that helped or hindered their development. Arnold J. Toynbee, one of the foremost historians, has chosen selections which demonstrate his theory that all civilizations pass through similar transitions and that we can better understand our own times through a study of the past.

We can use history to give us

binocular or stereoscopic vision, so that we see all around today's problems. Life in the present takes on a deeper meaning in the larger context of time. When you put a picture of history into the viewer alongside one of a similar event of today, you get a roundness. The picture enables you to judge the necessity and importance of proposals for action today. It even provides examples of the results that may be hoped for, and warnings about the failures.

Therein lies the secret of a rewarding use of history. We are not seeking to put history under a microscope, to cut it into slices for critical examination. What we do want is to apply the experiences of the past to events today. A spark from another age may illuminate our problem, and help us to plot our course.

Open-Mindedness

Nothing can be more precious and useful to anyone than open-mindedness. The hidebound politician cannot become a statesman; the one-idea business man cannot become a great captain of industry; the bigoted man or woman cannot enjoy the fulness of satisfaction that life proffers.

History contributes to open-mindedness. It shows that people holding widely different views of social, political and religious matters have lived worthily and contributed their share to achievement in the arts, letters and sciences.

Mature thinking is aided by history. The student of history is less likely than others to believe that any opinion is altogether right, that any purpose is altogether altruistic, that any calamity is altogether deplorable. He is less likely than people ignorant of history to pin derogatory labels on people; to emphasize differences so as to stir angry emotions; to allow prejudice of race, creed or caste to dictate his association with people around him.

A knowledge of history begets prudence. Throughout the years men have been trumpeting the end of the world. We are constantly under the feeling of crisis. Sometimes we become exasperated, but a better way would be to look back over the record.

Such an examination will show us how some peoples mastered their difficulties by making well-directed efforts in a united way, while others were defeated by difficulties because they refused to recognize them or depended upon someone else to resolve them.

Culture and Maturity

History is essential to the thinking of a cultured person. It is a necessary ingredient of maturity.

To prove these statements it is necessary only to think back upon the difficulty of making conversation with a person who has nothing in the past with which to compare or to which to relate a matter of immediate significance. There is nothing more exasperating for educated people in the society of the uneducated than this restriction of conversation by the limitation of their mental world.

American culture has its roots in many lands. When we follow those roots back we find that what we are today is part and parcel of all humanity. It is only through our history that we can become completely conscious of ourselves.

But in order to benefit fully we need to read history across the frontiers instead of reading our history as ours and foreign history as something external. We need to accept the fact that other ways of behaving exist as well as our own and that they serve the

needs of other human beings. Our own problems can only be understood when placed in a general world setting.

The facts of history are connected by skeins of consequences in every direction. We are part of a civilization, as well as being a nation, and that civilization grew out of and exists alongside other civilizations. Realizing this, we are warned against rash, unjust, narrow and selfishly one-sided action.

Official international policy, expressed through the United Nations Educational, Scientific and Cultural Organization, favours the improvement of history teaching in schools so that it will more effectively contribute to international understanding. A UNESCO handbook seeks realization of the fact that human beings are everywhere sufficiently alike to be thought of as virtually members of one family; that they have everywhere the same sort of problems, for example to feed and protect themselves, to bring up a family, and so on; and that everywhere they admire beautiful things and aspire toward fine and noble things, even though their standards of beauty and nobility may differ.

It is not sought to exclude the teaching of national history, but to explain it in the light of general world history. National history gains added significance by being placed in a large setting.

Truth In History

History is made up of the living issues of the day in which it is made. Its laboratory is the world we move about in. It is added to daily by trivial happenings. The problem is to decide between the relevant ifs and might-be's of history.

Like all the sciences, history seeks truth. It must be as true to facts as human fallibility will allow. It is not history if it is written by gossipmongers and propagandists. If the actions it records are honourable actions, they demand nothing more than truth. Where embellishment shows itself, suspect the report.

To tell the truth in history does not necessitate being dull. Great historians are interested in reporting events as they see them, but are not obsessed by fact.

Man is something more than a doer of deeds. The story of his life need not be a dreary chronicle of unrelated events, but should be a marvellous drama of thought, feeling and action. Marc Anthony and Cleopatra found making history a most exciting business: it would be an injustice to tell their adventures dispassionately.

Sir Winston Churchill's history writing, as the *New York Times* reviewer describes it, is "Personal and proud, judicious and illuminated by a long historical perspective, rich with the grandest and most stately prose written in our time."

There is still a great field for good and able popularization on the elementary levels. Sir Walter Scott in his novels, and Jane Porter in *The Scottish Chiefs* have used fragments of the truth which historians scornfully threw behind them. It was by using imagination that Parkman made so real Wolfe's battle array on the Plains of Abraham. He put the drama of Vaudreuil's capitulation at Montreal into a single sparkling sentence: "Half the continent had changed hands at the scratch of a pen."

Does it matter whether or not King Alfred let the cakes burn; that Sir Francis Drake finished his game of bowls before going out to scatter the Spanish Armada; that Wolfe recited

Gray's *Elegy* as he approached the Citadel? These stories serve to illustrate the character of the men. History does not consist only of the great events that mark the years and centuries but of the thoughts that guided and inspired people.

History may be learned in a most congenial way by reading biographies, the actual drama of men and women. Sometimes people pressed their way to the front of events, but more often they just happened to be there at the right time, like the little Dutch boy who saved the dyke by plugging a hole with his finger. The story of how they came to be there, what they did, what impelled them, and what the results were: that story is history.

Stories In Stones

We are altogether too likely to overlook history that lies outside history books, history that is written in our buildings, our art, our handicrafts, our folk-songs. Look at the diversity of their history left us by the Greeks: civil history, epic and lyric poems, drama, philosophy, architecture, sculpture. All these—an ode of Pindar, a marble centaur, the stately columns of the Parthenon—tell the spirit and life of a people. Every brass tablet in Westminster Abbey, every bust in the French Academy, signifies something that influenced the preparation of today's environment.

We need imaginative eyes to see it all. Toynbee tells us that toward the end of the 18th century "the living generation in the Middle East were squatting among the amazing ruins of extinct civilizations without being moved to inquire what these monuments were."

It would serve well if we were to make sure that no ancient building can be torn down, no ancient map or record destroyed, until competent people have examined its worth as part of our history.

History Need Not Depress

Some people may avoid reading history because they become depressed by the slowness of the upward curve they see in the record of human affairs. But if there is much folly in the record, there is also much greatness; if there are many mistakes revealed, there are also great moments of inspired action.

We need to pay attention to the significant things, and avoid wrangling over the trifles. Even if we find that we were mistaken in setting the creation of the world at so recent a date as 4004 B.C., it is at any rate better to look back that far than to see no farther back than the birth of this Nation. If we become confused by the fifty different reasons given in various books for the outbreak of the two world wars, yet we have a better understanding of the cause than if we assumed there was only one reason, or no reason at all except Fate.

When we read the story of mankind we find that there has never been a period which has not been regarded by some of its contemporaries as critical. History seems to be made up of one crisis after another. Ours appears to be more serious because we are in it.

Familiar refrains about the "breakdown" of Western Civilization may obscure, unless we read history, the extraordinary creativeness that has made this civilization the richest, most dramatic spectacle in history. It has, says Herbert J. Muller in *The Uses of the Past* (Mentor, 1952), maintained a high level of creative activity over a longer period of time than have previous societies. We are inheritors of

knowledge, skills, arts, ideas and ideals, of enduring things that we should not willingly give up, but which we are apt to forget because we take them for granted.

A man without history is like a sleep-walker who finds before him in the morning what he has done in his sleep. The nation that neglects to know its own history is limited to the short present of the now living generation. The business enterprise without records is bedevilled by the rush to catch up with developments that records would have enabled it to anticipate.

On the broadest plane, what reason is to the individual, history is to the human race. By virtue of reason, man is not, like the brute, limited to the narrow present, but also has available to him the incomparably more extended past with which the present is linked and out of which it has proceeded.

COMMAND DECISIONS OR PLANNING DECISIONS?

"Under modern conditions it is impossible, even in time of active war but to a much greater extent in time of "cold war" or peace, to draw a sharp distinction between planning and command. During the second World War, planning decisions were to a considerable extent command decisions, since they established the conditions under which field command would have to work and determined the tools it would have available to work with. With the coming of peace or cold war (whichever term one prefers), planning became an even greater element in command. Under combat conditions the field commanders necessarily make the major decisions; under the non-combat conditions, the responsibility necessarily falls to the staffs. The essential questions cease to concern the best utilization of organized troops in the field; they become questions of the adoption of weapon systems, the over-all utilization of manpower, the expansion of the "readiness" of one service at the expense of the "readiness" of another. All these are staff, rather than command, decisions. They are not taken in the heat of battle, but rather in cool calculation of what battle might at some unknown future date require.

Yet they have the effect of command decisions. Those who make or endorse the plans are in effect determining the strategy both for peace and for the opening phases, at least, of a future war; they are giving the commands which really count."

—From *Arms and the State,* by Walter Millis, with Harry C. Mansfield and Harry Stein, Twentieth Century Fund, New York

THE FEDERAL HISTORIAN — *Vital, but Seldom Understood*

By WILLIAM R. STEVENSON and ROBERT A. SMITH, III

In contrast with the preceding article on the relative merits of history, which was general in nature and scope, the following article by two military historians, Mr. William R. Stevenson and Mr. Robert A. Smith, III, is limited in breadth and pertains directly to Federal historians and more specifically to military historians.

Mr. Stevenson and Mr. Smith have applied many of the same reasoned concepts on the application of history to the military historian that were expressed in the previous story, but from a different vantage point.

Mr. Stevenson, born in Vero Beach, Florida, received his education in Indiana. In 1939 he enlisted in the Navy, serving in the Pacific on destroyers and LSTs during World War II. After his release from the Navy in July 1945, he received his AB from Indiana University in 1948. He studied for awhile in Sorbonne, Paris, France, then accepted a position as historian with the U. S. Air Force in Europe. He is presently with the Army Rocket and Guided Missile Agency, Redstone Arsenal, Alabama, as a Publications Writer.

Mr. Smith, a native of Alabama, attended Louisiana State University and the University of Alabama. He enlisted in the U. S. Marine Corps in 1941, and after his discharge in 1945, he returned to the University of Alabama where he received a BA in 1949. He began his government career as an Air Force Historian at Brookley Air Force Base, Alabama, and at present is also a Publications Writer at the Army Ballistic Missile Agency at Huntsville, Alabama.

[History] hath triumped over time, which beside it nothing but eternity hath trimuphed over.

. . . Sir Walter Raleigh

There have been few roles as misunderstood and misused as that of the military historian. His contributions are only vaguely realized because many military officers, it seems, lack academic preparation and historical application. Furthermore, because the vast majority of the military historians' products are classified, little knowledge of his program seeps out to the general public.

In spite of this, military history, where given the opportunity, has increased in stature and importance since World War II. Perhaps this trend has resulted from a realization, as Allan Nevins [1] points out, that all history—

social, economic, political, and military—is interdependent and interrelated. In other words, its unique utility is its catholicity. J. F. C. Fuller [2] expresses still another reason for this increased attention in the preface of his volume *Decisive Battles of the U. S. A.*, namely that Military struggles have made the United States what they are and will make them what they will become. Tyson Wilson [3] supports this premise stating ". . . the study of Military history adds to the understanding of important eras in our history" and ". . . adds knowledge and interpretation to specific periods." Fuller went on to state that logically then ". . . a nation which studies its past military history will not only be the better prepared to defend its liberties, but also the better placed to turn war to its advantage."

Nevertheless, as Arthur A. Erkirch, Jr.,[4] paraphrasing Gordon Craig [5] points out ". . . there is a strange feeling of dissatisfaction among students [6] of military history." It is to attempt to explain this dissatisfaction that this paper has been written.

Many laymen, both within and without the Federal structure, are guilty of selling short the real value of history. Of the many reasons given, perhaps the most cogent is that we are living in a dynamic age and should not be tied to the dead past. What a serious and fallacious charge. To the contrary, history, by revealing civilization's past failures and the analytical reasons for its successes, releases one from the past. It is the springboard from earth-bound antiquity to the unknown heights of the space age. It is the one thread of continuity in the fabric of human endeavor woven by searchers for truth; although human weaknesses being what they are, it is occasionally colored by the bias of the individual or the dictates of the state. The very essence of life is contained in the unhurried throbbings of historical writing. Look there and you will find answers not found amidst the rash and chaotic dogmas governing daily life.

From time to time high ranking military and civilian executives give the military historians and their programs verbose praise. When their actions are analyzed, however, it appears that they are primarily motivated by a desire to be fashionable and to be identified with the intellectual elite. Such praise then amounts to little more than lip service spoken to mollify the listener. In the past such banal utterances have borne little fruit and in many locales the military historians continue to stagnate in the dark corners of the organizations forced to harbor them. In such cases, the historian becomes a stepchild, unnurtured and unwanted, and the historical program slowly dies of malnutrition.

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[1] Nevins, Allan, "The Tellings of a Nation's Story," *New York Times Book Review*, Feb. 16, 1958. Mr. Nevins is a Professor of American History at Columbia University.

[2] Major General (Retired), British Army.

[3] Wilson, Tyson, "Military History: Pro and Con, Part II, The Case for Military History and Research," *Military Affairs*, Vol. XXI, No. 2, Summer 1957, American Military Institute, Washington, D. C.

[4] Erkirch, Arthur A., Jr., "Military History: Pro and Con, Part I, Military History: A Civilian Caveat," *Military Affairs*, Vol. XXI, No. 2, Summer 1957, American Military Institute, Washington, D. C.

[5] Gordon Craig pointed out that "the military historian has generally been a kind of misfit, regarded with suspicion by both his professional colleagues and by the military men whose activities he seeks to portray."

[6] Within the concept of this paper the "students of military history" are those historians employed by the armed forces, but the tenets of the paper may be extended to other historians in Federal service.

Some military historians have suffered greatly at the whims of some of the public relations personnel who, since December 1953, have been assigned to monitor the historical program. In many instances the public relations personnel have not only dishonored the historical program but have also done great harm to the fine profession of public relations. From an intense desire to please their superiors and to reveal only the rosy side of life, these public relations personnel have subjected the historian to much unnecessary censorship and many assumed restrictions. As a result histories become distorted and objectivity is lost. The further in time a historian is removed from an event the greater is his perspective. BUT, and this is extremely important, the military historian is close in time to the majority of events about which he writes. It is essential, therefore, that he should be subjected to a minimum of censorship and afforded the maximum in freedom of action. If history is to be submerged in public relations, then let the office chief in some small measure possess the talents of Walter Lippmann.

The stylized speeches of many of our public officials reflect the work of public relations people. As Dorothy Thompson [7] so aptly put it, "Who is speaking and do they really know what they are speaking about?" When public relations people put words into the mouths of historians who are willing to accept them, history becomes a jumble of stereotyped garble—pleasing only to the ear of the one who dictated it or to the superior who requested it. Unfortunately, when repeated often enough these writings come to wear the frock of truth and can be disproven only by concentrated and diligent research.

Factual history cannot be written if the historian is denied access to important personages, information, documents, or subjected to censorship other than the verification of facts. If our civilization does become triumphant through the trial and error process, then it behooves top Government and Military officials to place a greater reliance on the military historian and to permit him greater freedom in order that he may accurately and analytically portray the plethora of factors accounting for the fantastic evolutionary developments of this age. Only by so doing can the top Government and military leaders acquire sound foundations upon which to base future planning. It must not be forgotten at this point that the first step toward a dictatorial government is to control the information media—that is, to distort current events and rewrite history to suit the whims of the ruling autocracy. A half-truth is worse than its complete absence. The utility of history is based on its truthfulness and impartiality.

The Military historian must truly feel great humility when he honestly and diligently attempts to give the dignity and immeasurable value inherent in his role. The development of a great school of Military historians, however, is not always obtainable because the present milieu besetting them does not make it possible. Good writers, good editors, and good critics are easy to come by, but originality and an inquisitive nature, the vital essentials of a superior historian, have to a large extent been squelched. Oftentimes this has resulted in the accumulation of slanted history and a constant drain on objectivity.

History is the accepted guide and

[7] Thompson, Dorothy, "Ghost Writers Influence over U. S.," The *Mobile Press*, 11 June 1958.

teacher of nations. Its very essence should be truth or the constant search for it. History, by defining past mistakes and errors, enables the Governmental planners and leaders to chart and steer steadier courses to the future. It follows then that a thorough study of all phases—economic, social, political, and military—of past history should be a prerequisite to all top level Federal and military agencies. Perhaps then, these people, fortified with a better academic preparation and historical application, would place greater reliance in the historian and afford him greater support. Thus armed, the historian, with unrestricted freedom and access to the leaders and documents, could produce more objective and factual histories to guide the planners and leaders.

History cannot be escaped. As it has in the past, history will continue to chart the course of events through the unknown shoals of the future. The far-reaching events through which we are passing compel us to seek true enlightenment. The immense responsibilities assumed by the Federal government in world affairs has placed a heavy burden on the historians. If we look behind the military catch phrases and bureaucratic verbage with which our leaders surround themselves, we will find the fundamentals as they are —the true reasons for particular successes or failures. Learning does not have to come through additional suffering, but rather, it is inherent in the serious lessons of history. At this climactic moment in history the future destinies of Western civilization are unknown, but military historians are in a position to add a great deal to understanding this future by explaining the past, thereby enabling our leaders to bridge the gap between the past and the future by direct application of sound logical processes, rather than by the trial and error method.

Indeed, as George Santayana so aptly said, "Those who cannot remember the past are condemned to repeat it."[8]

[8] Boehner, William F., Jr., "Queries and Answers: History's Mistakes," *The New York Times Book Review*, 6 July 1958, p. 15.

THE TECHNOLOGICAL CONTEST

—"Strong voices have been raised asserting that in the period of 1960-1964 we may be so far behind the Soviets in long-range missiles that our deterrent power will cease to be effective, and so our national life will be in jeopardy. My answer is that our deterrent power can certainly be kept strong and should continue to be effective, if we stay on our present course and make timely decisions to bring new weapons into production when their development and effectiveness are reasonably certain. I say this although I believe the Soviets are today somewhat ahead of us in the development of the ballistic missile."

—Hon. James H. Douglas in an address to the Air Force Association in Dallas, Texas on 27 Sept. 1958.

AIRMAN'S BIBLIOGRAPHY

SOVIET STRATEGY IN THE NUCLEAR AGE, by Dr. Raymond Garthoff, New York: Praeger, 1958, $4.50.

This book brings clearly into focus the impelling urge of the orthodox military mind to conform to the patterns of the past in tailoring military force, both in structure and in strategic objectives, to meet the demands of future application.

Anchored to the assumption that their World War II strategy was sound and that their military forces were properly tailored and employed, the postwar military planners of Soviet Russia give tacit endorsement to these values in the progressive modifications that an expanding technology focuses on them. For them World War II was a surface strategy and, in prosecuting that war, air power was assigned almost exclusively to an ancillary role. This remains the current mission for a major portion of the Soviet air arm. Their strategy and its supporting military structure seemingly remains oriented to decisive military operations in surface actions.

The author, however, brings into full display two disturbing exceptions: they are, that the USSR is imitating Strategic Air Command in developing global air power, and that they disclose a sensing of the vital role that the submarine can play in intercontinental warfare, both in severing the sea lines of communications and in the direct application of firepower on strategic targets. They are placing heavy emphasis on expanding submarine strength.

To acquire a better understanding of a potential foe, any professional military man will profit from reading this book—if he scan it with an analytic mind.

O.A.A.

ALLIED WARTIME DIPLOMACY, by Edward J. Rozek, New York: John Wiley & Sons, Inc., 1958, $6.95.

This scholarly prepared documentation on the rape of Poland should be *must* reading for all professional men in the diplomatic and military fields who aspire to greater professional competence and worth. It presents a demanding challenge to the inquisitive student to face the grim realities of the successive diplomatic defeats that characterized the political category of conflict in the conduct of World War II in Europe. That these cumulative catastrophies stemmed from a strategy that had nothing better than the irrelevant objective of "unconditional surrender" to guide it, gives little solace for the magnitude of the tragedies that we suffered at diplomatic conference tables.

Alibis can be and are advanced that the impelling need to reduce the "blood-bath" toll of military conflict and at the same time satisfy the expanding cry from the home front to "bring the boys home," gave justification to the appeasements that were successively made.

Another alibi that is used too freely states that our representatives couldn't know from foresight that integrity was not a feature of any Stalin pronouncement. None of these alibis stand up under the revealing exposures of the author. He discloses, with ample documentation, that the Kremlin had convincingly demonstrated that their treaties and agreements were never binding long before we launched our appeasement program.

The author disturbingly supports his observation that, using their political and military weapons as interchangeable in furthering their persistent but diversified endeavor to overturn the Western democracies,

the Soviet conspiracy is making measurable progress on the road to world domination. Any definitive reader of this exposing book will gain a sounder understanding of the perils democracies are facing.

O.A.A.

THE UNITED STATES AIR FORCE REPORT ON THE BALLISTIC MISSILE; ITS TECHNOLOGY, LOGISTICS, AND STRATEGY, edited by Lt. Col. Kenneth F. Gantz, Garden City, New York: Doubleday & Co., Inc., 1958, 338p. $4.00.

This book consists of a selection of contributions from the "Ballistic Missile" issue of the *Air University Quarterly Review*, vol. 10, no. 1, Spring 1958, and other issues of that publication, with an added chapter by General Thomas S. Power, Commander in Chief of SAC entitled "SAC and the Ballistic Missile." The General deals primarily with the qualifications of the ballistic missile as a strategic weapon system, and its mutual relationship with those other factors which, in combination with the weapon system, represent strategic capability. He indicates that SAC is utilizing its entire organization, facilities, and experience in strategic operations for the earliest possible achievement of an Initial Operation Capability in the employment of ballistic missiles. "SAC is rapidly approaching that capability and, thereby, a capability for retaliation and deterrence still more advanced than it has now."

General Thomas White, AF Chief of Staff, describes AF plans for space operations considering missiles but another step in the evolution from manned aircraft to true piloted spacecraft. Major General Bernard A. Schriever, Commander of the Ballistic Missile Division, Hq. ARDC, reviews the AF missile development program (Thor, Atlas, Titan) and emphasizes that ICBM and IRBM are not ultimate weapons or that the ballistic missile will replace the manned intercontinental bomber, but that these weapons will remain deterrent forces. Colonel Edward N. Hall, AF Ballistic Missile Div., Hq. ARDC, discusses AF missile design and development, distinguishing between the AF program for ballistic and aerodynamic types of vehicles designed to cover many applications over both long and intermediate ranges.

Other chapters deal with command and control of the missile (Major General Charles McCorkle, Asst. Chief of Staff for Guided Missiles); logistics (Major General Ben I. Funk, Director Ballistic Missile Office, AMC); impact of the missile on warfare (Col. Alexander Sheridan, Air War College); impact of the missile on defense (Col. Harvey W. C. Shelton, Air War College); missilemen (Col. Allen W. Stephens, Hq. 1st Missile Div., SAC); and the missile test program (Lt. Col. Edward A. Swanke and Lt. Col. Richard K. Jacobson, AF Ballistic Missile Div., Hq. ARDC).

The impact of the ballistic missile on industry is treated from the viewpoints of the Air Force, an airframe manufacturer, a rocket engine producer, and the electronic industry.

The scientific and technical fundamentals underlying ballistics missiles are skillfully surveyed for the layman in a 46-page contribution by a group of experts from the Space Technology Laboratories of the Ramo-Wooldridge Corp. that serves as AF Ballistic Missile Div. technical staff to provide systems engineering and technical direction to AF contractors. A more technical treatment is afforded the topics of navigation and operations analysis of force survival by Major Kenneth A. Smith, Air Command and Staff College, and Col. Robert D. Bowers, AF Ballistic Missile Div., Hq. ARDC, respectively.

A chapter entitled "The USAF Reports to Congress" compiled by the editor from selections from the verbatim testimony of Generals White, Schriever, Putt, and Irvine as well as of non-Air Force personnel before the U. S. Senate Preparedness Investigating Sub-committee of the Committee on Armed Services, provides some intimate views of the positions taken by these AF leaders. Included is General Schriever's prediction of 9 January 1958 that the USAF could immediately initiate unmanned reconnaissance of the moon by adding existing third-stage hardware to the Thor and put space probes out to Mars and Venus with a slightly modified Thor plus a high-energy fuel stage presently under development. A

glossary of some 200 terms related to the technological and operational aspects of the ballistic missile and biographical notes on the contributors are appended.

These selections provide the general reader with a descriptive, although at times superfluous and rather tedious, account of the U. S. Air Force's missile program. The book is timely and certainly authoritative, but one might question the need for a commercial version of a series of papers printed in the *Air University Quarterly Review*, a professional journal readily available to anyone interested. The editor must be commended for his selections and his desire to bring the Air Force's missile program to the attention of the public. The public, in turn, should exercise its objectivitiy and realize that this report represents necessarily only the Air Force's viewpoint which, although a very potent one, is not the only one.

The absence of any speculations concerning atomic or ionic propulsion in those contributions which afforded predictions concerning space operations is noteworthy. This may be attributable to security restrictions, but might also be interpreted as lack of confidence on the part of these authorities in foreseeing any likely break-through in these fields.

The lack of an index and bibliography is regrettable.

CHARLES M. GOTTSCHALK
Library of Congress

THE DIVINE WIND, by Rikihei Inoguchi, Tadashi Nakajima and Roger Pineau, Annapolis, Maryland: U. S. Naval Institute, 1958, $4.50.

There exists a tremendous fascination for the Occidental mind to attempt to discern the psychological "why" for the Japanese attitudes and actions in the conduct of war. This is one of the pirmary reasons why the reading of THE DIVINE WIND, the story of Japan's Kamikaze force in World War II, holds immediate and lasting attention until the book is finished. Although no specific, final, or definitive reasons are given by the authors for the relative ease with which young aviators volunteered or were selected for suicide tactics in those final stages of the war in the Pacific, they do attempt to give some enlightenment by offering various reasons and approaches to the psychological question which has intrigued observers as well as nonmilitary people since the inception of the most eerie and weird spectacle of World War II, the Kamikaze offensive.

The young pilots of the Japanese Empire never questioned the responsibility of their commander, Vice Admiral Takijiro Ohnishi, who organized the original Kamikaze units. They never thought they were doing anything extraordinary, and in fact, their greatest concern, according to the authors' interpretations of their actions, seems always to have been to make sure they hit the target. Death to them was a matter of minor importance. Perhaps the most significant reason given for the attitude of these young pilots toward the acceptance of sure death in the defense of the Japanese Empire at that stage of the war was a strong belief in "life through death." This attitude has been one developed through long tradition and creed of the Japanese people. The second most important reason is, they felt that they were dying for the great cause of their country, and unstintingly proved this by their total willingness to die in the service of their Emperor and country.

The Japanese authors, Inoguchi and Nakajima, were closely associated with the Kamikaze units from the time of the original concept as propounded by Admiral Ohnishi, until the final death blow, when all the aerial and sea might of the Japanese Empire was totally exhausted. Because of this they are perhaps as well qualified to write on the subject of Kamikaze as anyone. In actuality, however, the book is more an historical chronology of the development and employment of the Kamikaze forces, than a psychological revelation of the Japanese mind which enabled this vastly intriguing subject to be developed in the first place.

It is not altogether a truism to state, however, that it is not for the Western mind to understand. The spirit of the Kamikaze or "shimpu" (suicide) attack units is not a thing of total strangeness to the Westerner. The Light Brigade rode to certain death in the battle of Balaclava in the Crimean War.

The use of dive bombers and torpedo bombers by Americans in the early part of World War II were in actuality modified forms of suicide attacks. There existed the actual concept of "one-way missions" in the interim following World War II, because of the limited capability of our bombers which were in existence at the time, if the necessity for their use should ever have arisen. Even today, there is a prevalent attitude that jet aircraft taking off from aircraft carriers, in all probability, will be flying "one-way missions," because the mobile base from which they will be launched may not be there when they return,—if they return. Of course, there is a difference in the attitudes of approach between Western and Occidental minds. The men of a democracy will undertake seemingly suicide missions with the supporting belief that they will return regardless of the magnitude of the hazard they face.

In the presentation of this story, however, it seems that some important factors have been overlooked, perhaps deliberately. The Japanese Empire was in the throes of definite defeat by early 1944. The development of the Kamikaze force in late 1944 was therefore more than somewhat tardy. By that time the Navy of the Rising Sun was little more than a token force. Regardless of the attitude of the pilots and fighters and the Japanese Navy in adherence to the spirit of loyalty to the Emperor and the Empire, the cause and mission of the Kamikaze were hopelessly belated. The casualty statistics, however, for both men and ships convincingly disclose the potential of this form of attack.

At the time of the full-scale Kamikaze attacks on the American Navy in the Okinawa area the U. S. Navy itself had lost much of its meaning and importance, since there was no enemy sea force of any strength to resist her. Further, the establishment of air bases within the perimeter of Japan had made her wholly vulnerable to a decisive strategic air attack that could achieve decision, with or without further surface offensives. In terms of time, the Kamikaze units chose the wrong targets upon which to wreck their holy vengeance. But even though the timing and the targets were badly chosen, this form of attack still demonstrated its power and effectiveness over naval targets confined to the surface of the seas.

It is erroneous to think that the Kamikaze offensive was a small, unimportant nuisance type of operation. What started out to be a small form of resistance with definite intent to sink the U. S. Navy in the seas about the Philippines in late 1944 grew, and was continued until the approaching end of the war. Altogether, about 4000 Japanese pilots volunteered to crash-dive against enemy shipping vessels. Between 1228 and 1356 Japanese planes were sacrificed in this last ditch type of resistance; (Both figures are given in the book in different places, and it is understandable that there should be some discrepancy.) 322 American vessels of all sorts were casualties to this attack, with 77 being credited as sunk by Kamikaze action.

In treating with the Kamikaze operations as they were actually conducted, the book is wholly engrossing from beginning to end, and especially at the end where the reader is given glimpses of beauty and poignancy in the attitudes and spirit of the young aviators, in their letters home to loved ones before their final suicide missions.

CARMAN P. FELICE
Major, USAF
Military Liaison Officer
The AFHF

THUNDERBOLT, by Robert S. Johnson with Martin Caidin, New York: Rinehart and Company, Inc., 1958, $3.95.

What are the ingredients that make a man an ace in aerial warfare? What elements and qualities set him apart from the crowd, and tend to make of him the hunter, rather than the hunted? What makes a man a tiger?

One will not find all the answers to these questions in this fast-moving and absorbing autobiography by Robert S. Johnson, written in collaboration with Martin Caidin. Searchingly, one may find some answers and some clues to others. But it is quite evident that this book, together with the sudden rash of other books appearing for public consumption on aces and aerial battles, will eventually provide researchers

and inquisitive psychologists with definite answers at some time in the future.

What then are some of the elements or qualities which help to set a man apart, in the cockpit of a fighter? Certainly, it is easy to enumerate some of the more obvious: a deep faith in God; an abiding sense of righteousness; desire and love to fight; a spirit of adventuresomeness; an ability to listen and absorb lessons of the experienced; a keen mental intellect; excellent physical attributes such as good muscular coordination and outstanding vision; a capacity for punishment and a talent for absorbing defeats and frustrations; and, an avenging attitude of mind. Readers and critics of this book will add some others; certainly this list is not exhaustive. However, who can say conclusively that it is the innate, inherent qualities a man is born with that sets him apart, or whether it is environment, or both? An ability to face the challenging problems of environment and come out with solutions has produced some of the world's greatest fighters and thinkers.

From his childhood in the small town of Lawton, Oklahoma, until the final battle over Germany, Robert S. Johnson exhibited or expressed, in some measure, all the qualities already mentioned. Contrary to fiction, Johnson, like the majority of other aces, was not born to greatness. He had to learn the hard way. In fact, there were times of doubt and frustration when he himself, as well as his superior and commanding officers, thought he would not even come out of his first aerial battle alive! Johnson blundered and goofed, time after time. When he went to England with the 56th Fighter Group, he could not even hit a tow target sleeve!

Set apart in an environment that demanded greatness or perish, Johnson matured to the task. He found himself in the company of "great" men — fighters all; Zemke, Gabreski, Mahurin, Schilling, Jerry Johnson and many others. (The 56th boasted of having the greatest number of aces in World War II.) He was assigned to pilot what turned out to be perhaps the most rugged of all World War II aircraft—the P-47 Thunderbolt. Tales are legend of the incredible ability of the P-47 to take punishment and still be able to return home. He learned every eccentricity of the P-47 until he could fly it blind, as he was forced to do later on; he learned to become a team man; he learned how to force the "Kraut" to fight the game according to the best qualities of the P-47, rather than against the best qualities of the German craft. Only after all this did he begin to shoot down the Me 109's and the Focke-Wolf 190's.

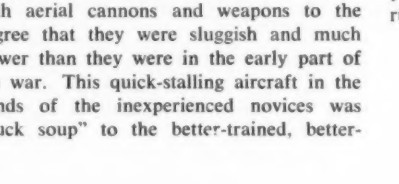
Attesting to the ingenuity and intuitiveness of the American fighter is the fact that the P-47 became such an outstanding vehicle of warfare. As described by Johnson after the Group's arrival in England, all "experienced" fighter hands were heartily discouraging about the ability of the Thunderbolt to engage successfully in battle with the highly maneuverable German aircraft. Without precedence to lean on nor past history to guide them, the pilots of the 56th gradually evolved superior tactics by making best use of the superior qualities of the "jug." This, combined with the fantastic ruggedness of the airplane, together with brilliant leadership techniques of the personnel who commanded and flew them, made the 56th the outstanding fighter group of the war.

The book is racy and intensely entertaining; a fast reader can devour it in one sitting of two to three hours. The battle scenes are vivid; in fact, sometimes too vivid after about a fifteen-year span since they happened, and perhaps sometimes a bit contrived. It seems, too, that much literary freedom was taken to give prolonged dramatic stature to the long series of battle scenes, while several pertinent factors of reality were obviously overlooked. The most important of these is that in the waning stages of the air war, the Germans had to throw into the sky every fledgling flier they could get ahold of. Young Germans, obviously just released from a minimum of training, were pitted against the superior American airmen. A decided shortage of fuel and training aircraft necessitated a short and almost ineffective training period for the German pilots. The skilled German pilots had long since departed from the skies, with the exception

of a few who might have appeared occasionally in a dogfight. The other important factor is that the German technicians, in striving for supremacy in the air by any means, overloaded the FW 190's with aerial cannons and weapons to the degree that they were sluggish and much slower than they were in the early part of the war. This quick-stalling aircraft in the hands of the inexperienced novices was "duck soup" to the better-trained, better-equipped and battle-experienced American pilot.

En toto, the book is engrossing. Pick it up and you will not want to lay it down until you have finished—except for an interruption of great importance.

CARMAN P. FELICE
Major, USAF
Military Liaison Officer
The AFHF



Recent Books

Adams, Dr. Carsbie C., *Space Flight: Space, Space Stations and Space Travel Explained,* New York: McGraw-Hill, 1958, $7.50. A happy blend of historical review and scientific treatise on the astronomical and engineering fundamentals of space flight, plus a broad outlook into the future of space flight.

Baldwin, Hanson, *The Great Arms Race,* New York: Praeger, 1958, $2.95. Relative strengths and weaknesses of Soviet and American armed might with a keen analysis of our defense organization.

Bowles, Chester, *Ideas, People and Peace,* New York: Harper, 1958, $2.50. Recent world developments and their relation to the U. S.

*Brown, Kimbrough S., and H. J. Nowarra, *Von Richthofen and the Flying Circus,* London: Harleyford Publications Limited, 1958, 45s.

*Cate, J. L., and W. F. Craven, *The Army Air Forces in World War II,* Chicago: Chicago University Press, 1958, $8.50.

Daugherty, William E., *A Psychological Warfare Casebook,* Baltimore: Johns Hopkins Press, 1958, $12.50. Not for the casual reader, but a valuable reference for the serious student in an exceedingly important field.

Ferguson, Bernard, Editor, *The Business of War: The War Narrative of Major General Sir John Kennedy,* New York: Morrow, 1958, $5.00. Memoir of a man who was a central figure in Britain's military strategy from 1940-1944. A stimulating and amusing book.

Gavin, Lt. Gen. James M., *War and Peace in the Space Age,* New York: Harper, 1958, $5.00. The General concludes that the country cannot survive unless the Pentagon can manage to see, decide and act more effectively.

Green, William, and John Fricker, *The Air Forces of the World: Their History Development and Present Strength,* London: MacDonald & Co., 1958, £3.0.0. A thorough and well-illustrated handbook, giving an overall picture of the air forces of 84 countries including their historical development since World War II.

Halle, Louis J., *Choice for Survival,* New York: Harper, 1958, $2.75. The problems of thermonuclear weapons and the diverse methods of dealing with this global dilemma.

Howe, Irving, and Lewis Coser, *The American Communist Party,* New York: Beacon Press, 1958, $6.75. A critical history

of the party from its founding in 1919 to the present.

*Johnson, Robert S., and Martin Caidin, *Thunderbolt: the Extraordinary Story of a World War II Ace*, New York: Rinehart, 1958, $3.95.

Kecskemeti, Paul, *Strategic Surrender; The Politics of Victory and Defeat*, Stanford, Stanford University Press, 1958, $5.00. Strategic surrender as a problem in political theory. The book was the center of controversy in the Senate due to a misinterpretation of its purpose.

Knight, Clayton, *Lifeline in the Sky*, New York: William Morrow, 1958, $6.00. The story of the U. S. Military Air Transport Service.

Krieger, F. J., *Behind the Sputniks*, Washington: Public Affairs Press, 1958, $6.00. A survey of Soviet space science which illustrates the remarkable talent for theoretical and practical applications to the field of rockets and space technology.

Lloyd, John, *ABC of Aircraft of World War I*, London: Ian Allan, 1958, 2£6.

Montgomery, Field-Marshal, The Viscount of Alamein, *The Memoirs of Field-Marshal the Viscount of Alamein*, New York: World, 1958, $6.00. A mellower "Monty" recalls his life story, but his opinions are still as assertive.

Morison, Samuel Eliot, *Strategy and Compromise; A Reappraisal of the Crucial Decisions Confronting Our Allies in the Hazardous Years, 1940-1945*, New York: Little, Brown, 1958, $3.00.

National Planning Association, *1970 Without Arms Control:* The Association, 1958, $1.25. A well-written compilation of the status and trends of modern weapons technology.

Pauling, Linus, *No More War*, New York: Dodd, Mead, 1958, $3.50. A Nobel Prize winning chemist presents facts about the nature of nuclear war and the concern of scientists over the threat under which we live.

*Pineau, Roger, Rikihei Inoguchi, and Tadashi Nakajima, *The Divine Wind*, Annapolis: U. S. Naval Academy, 1958, $4.50.

Russell, Lord, *The Knights of Bushido; The Shocking History of Japanese War Atrocities*, New York: Dutton, 1958, $5.00. This is a factual record of World War II brutality on the part of the Japanese, and the picture that emerges is one of stark horror.

Slim, Field Marshal Sir William, *Courage and Other Broadcasts*, London: Cassell & Co., Ltd., 1957. Beliefs acquired in part during the long hard years of the Burma War when he commanded men who fought the enemy under the most impossible conditions.

Stalin's Correspondence With Churchill, Attlee, Roosevelt, and Truman, 1941-1945, New York: Dutton, 1958, $7.50.

**Wedemeyer, Gen. Albert C., *Wedemeyer Reports*, New York: Holt, 1958, $6.00. The General criticizes U. S. strategy in the China theatre.

Wheatley, Ronald, *Operation Sea Lion, German Plans for the Invasion of England, 1939-1942*, New York: Oxford University Press, 1958, $7.00. An account which throws new light on Hitler's serious intentions of invading England and also serves as an interesting study of the operational activities of the German High Command.

** Reviewed in this issue.*

*** To be reviewed soon.*

"Modern technology and the weapons it produces overleaps the traditional boundaries between the military services. With modern weapons the distinction between missions of the three arms, land, sea and air, have lost their former validity. Military force can no longer be divided by means of locomotion."

—Anonymous

Recent Articles

Abraham, R. W. T., "The Role of the Strike Carrier," *Air Power*, Vol. 6, Autumn 1958, pp 31-33. Discusses the role of aircraft carriers and their aircraft in limited or global war.

Biorklund, E., "Policy, Grand Strategy and Nuclear Strategy," *Air Power*, Vol. 6, Autumn 1958, pp 25-29. The place of nuclear weapons and missiles in the strategy of both East and West.

Blackett, P. M. S., "Nuclear Weapons and Defence," *International Affairs*, Vol. 34, October 1958, pp 421-434. Discusses the views of Kissinger, Kennan and King-Hall on the role of tactical atomic weapons in NATO strategy.

Bogart, Maj. Gen. Frank A., "Logistics in the Space Age," *Air Force*, Vol. 41, November 1958, pp 144-147. Discusses the size of the logistic structure of the future and the respective roles which industry and the Air Force will play in it.

"Civil Defense Is Possible," *Fortune*, Vol. 58, December 1958, pp 98-101. Millions of lives *can* be saved by taking some reasonably simple measures to shelter population from fallout.

Clarke, Michael, "The Missile in Strategy," *Flying*, Vol. 63, September 1958, pp 29-31. With improvements in the technology of missiles, more missions can be assigned to them, but indications are they will not replace the manned bomber for the foreseeable future.

Eaker, Lt. Gen. Ira C., "Men in the Missile Age," *Ordnance*, Vol. 43, September-October 1958, pp 223-226. Just as the development of aircraft required men with unique physical and mental qualifications, so will modern missiles and space vehicles demand the development of a new breed of servicemen.

Eliot, George Fielding, "The X-Factor in Arms Limitation," *Orbis*, Vol. 2, Fall 1958, pp 300-314. There is no evidence that disarmament is a serious objectiv of Soviet foreign policy.

"Forty Years of American Foreign Policy," *Current History*, Vol. 35, October 195 pp 193-239. Eight articles trace the roo of American foreign policy starting wit World War I.

Hargreaves, Reginald, "The Chain of D fense," *Military Review*, Vol. 38, Octobe 1958, pp 11-17. Probable Russian strateg in assaulting Western nations in a globa war.

Howard, Michael, "Disengagement an Western Security," *International Affair* Vol. 34, October 1958, pp 469-476. Di cusses ideas put forward on withdraw of troops by both East and West fro Europe, by Hugh Gaitskell, Denis Healey George Kennan and Sir John Slessor.

"The Human Factor in Space Travel," *A University Quarterly Review*, Vol. 1 Summer 1958, pp 2-152. Special issue.

Jackson, Col. Bennett L., "Limited Defens Is Not Enough," *Military Review*, Vo 38, October 1958, pp 25-28. If attacke NATO's defense efforts must not be lim ited in scope but conducted aggressivel both militarily and politically.

Kecskemeti, Paul, "Strategic Surrender; th Politics of Victory and Defeat." Re viewed by Michael Armine, *Air Force* Vol. 41, October 1958, pp 69-73. A r view of the Rand Study which stirred tempest of confusion — "especially b those who hadn't read it."

Kissinger, Henry A., "Nuclear Testing an the Problem of Peace," *Foreign Affair* Vol. 37, October 1958, pp 1-18. Th author questions whether a complete su pension of nuclear testing is desirab whatever the possibilites of inspectio as he feels the answer to our politic dilemma is to be found in injecting greater sense of purpose into our overa performance.

Lang, Daniel, "Man in Space," *New Yorker*, Vol. 34, November 15, 1958, pp 106-128. Factors now under study in planning for a "man-in-space" program.

Mauldin, Douglas B., "The Pacific Barrier," *U. S. Naval Institute Proceedings*, Vol. 84, October 1958, pp 63-70. A discussion of the early warning system in the Pacific.

Lanning, G. E., "Wanted: An Anti-Missile Missile," *Air Power*, Vol. 6, Autumn 1958, pp 40-42. Problems of developing a successful anti-missile missile.

Melman, Seymour, "How Can Inspection Be Made to Work?" *Bulletin of the Atomic Scientists*, Vol. 14, September 1958, pp 270-272.

Mendershausen, Horst, "Economic Problems in Air Force Logistics," *American Economic Review*, Vol. 48, September 1958, pp 632-648. The infusion of economic concepts into military logistics will help in the development of a more rational use of human and material resources.

Merglen, Albert, "Air Transport — A Determining Element of Success," *Military Review*, Vol. 38, November 1958, pp 10-16. Discusses the role of airborne troops in World War II and predicts their importance in future atomic warfare.

Powers, Patrick W., "New Dimensions for Air Defense," *Army*, Vol. 9, November 1958, pp 24-25. Describes essential requirements of an effective air defense system.

Putnam, Col. Claude E., "Missiles in Perspective," *Air University Quarterly Review*, Vol. 10, Spring 1958, pp 3-10. It is important to keep missiles in perspective as an addition to the Air Force family of weapons. It is important to consider the kinship between aircraft and missiles in the evolution of military art.

Russia, *Realities* No. 94, September 1958, pp 7-74. A special issue devoted to Russian aims, economy, way of life, and an assessment of Russia's strong and weak points.

Slessor, Sir John, "A New Look at Strategy for the West," *Orbis*, Vol. 2, Fall 1958, pp 320-336. The West should supplement the policy of nuclear deterrence by economic and political warfare, and by an effective build-up of conventional forces for limited warfare.

Tauber, V. A., "How Computers Are Helping Solve Military Supply Problems," *Armed Forces Management*, Vol. 4, September 1958, pp 28-29. The services are discovering more ways electronic data processing systems can handle supply headaches.

NEWS ITEMS

Men of the Year Award

"To Major General Walter Campbell Sweeney, Jr., and the officers and men of Eighth Air Force:

New Englanders have watched in awe your vapor trails in the sky. We have admired your pride and military snap. We have praised the way you carried out your mission, strategic warfare, on a global scale.

But the United Press International Broadcasters Association of Massachusetts believes it is time the Eighth Air Force and its commanding general were cited for another skill.

Off duty, you have hunted our lost children. You have helped the injured of our highway crashes. You have aided our schools and worked for our churches. In short, your talents have helped make New England a better place in which to live.

It is therefore the unanimous vote of the directors of this organization to cite Major General Walter Campbell Sweeney Jr., and the men of the Eighth Air Force as New England's Men of the Year."

With this citation General Sweeney accepted in behalf of the men of his Eighth Air Force command a unique distinction and priviledged citation from the civilians of the New England area which serves as the home base for the huge SAC command. On the day of the citation, more than 90 newsmen from Massachusetts, Connecticut and Rhode Island visited the base flightline at Westover AFB, Massachusetts; listened to a briefing on SAC by General Sweeney, and a briefing on sonic booms by Lt. Colonel James Jabara, commander of the 337th Fighter-Interceptor Squadron.

Another "well done" to the men in blue!

COMING—F-108 and B-70 VALKYRIE

In recent announcements North American Aviation, Incorporated, of Los Angeles, California, has revealed that progress on both the F-108, the speediest of the Air Force's projected active fighters, and the B-70, intercontinental Mach 3 chemical bomber, is proceeding as expected.

To aid in the quick production of the F-108, North American announced that the assistance of International Telephone and Telegraph Corporation has been hired on a program leading to the development and production of a mission and traffic control system for the swift interceptor. This mission and traffic control system is designed to provide communications, navigation, identification and landing-aid functions for the F-108. Mr. Delbert L. Mills, president of ITT's Federal Division at Clifton, New Jersey, where the work will be done, stated that specialized services available at ITT laboratories and its Federal Electric Division, together with leading electronic companies, large and small, would be utilized to carry out the objectives and fulfill the requirements of North American and the U. S. Air Force.

At the same time, another sub-contract was let by North American to the Boeing Airplane Company of Seattle, Washington, to engineer and manufacture the wing for the B-70, Valkyrie. In making this announcement Mr. Raymond H. Rice, vice president of North American, and general manager of the Los Angeles division, stated, "Building the B-70 wing represents a large physical undertaking and will require the utmost skill in engineering, tooling and manufacturing techniques in view of the new materials required for this high performance weapon system."

The Air Force has announced that the B-70 wil be capable of speeds in excess of 2,000 miles an hour for long distances without refueling and will have a ceiling of more than 70,000 feet.

Selection of Boeing as a major contractor in the B-70 program came after exhaustive evaluation of proposals from aircraft firms throughout the country by North American with concurrence of the Air Force.

North American has estimated that more than 70 percent of the dollars allocated for the B-70 will go to other companies for the engineering and production of major systems.

Donald Wills Douglas, Sr., Recipient of Franklin Medal

Donald Wills Douglas, Sr. who used $600.00 in savings and a creative engineering mind to help build the air-age, was the recipient of the Franklin Medal, the highest award of the Franklin Institute of Philadelphia, Pennsylvania.

The founder and chief executive officer of Douglas Aircraft Company, Santa Monica, California, received the medal on October 15th, at formal ceremonies in the Institute's Franklin Memorial Hall.

Former Franklin Medalists of the Institute include Thomas Edison, who was the first recipient in 1915; Guglielmo Marconi; Orville Wright; and Enrico Fermi. The Medal is awarded annually to those workers in physical science or technology without regard to country, whose efforts, in the opinion of the Institute, have done the most to advance a knowledge of physical science or its applications.

Mr. Douglas was honored for "his creative engineering in the field of aeronautical design as exemplified in all of his work but particularly in the DC series of transport airplanes which have become standard equipment on airlines throughout the world.

and have set the pattern of design in this field; and in recognition of his engineering genius which has provided inspired leadership for the technical developments of his industrial organization."

Among Mr. Douglas' achievements is the design of the Douglas World Cruisers, which Army pilots flew on the first flight around the world in 1924. This feat gave birth to the Douglas trade slogan, "First Around the World." Mr. Douglas' firm is now engaged in the development and production of guided missiles. Douglas also has airframe responsibilities for "Thor," an intermediate ballistic missile. In the commercial transport field, the Douglas Company is now engaged in building the DC-8, Jetliner.

Donald Wills Douglas Sr. was born April 6, 1892, in Brooklyn, N. Y. He entered the U. S. Naval Academy, Annapolis, in 1909. Although he had attained high academic standing, he resigned from Annapolis after three years to study aeronautical engineering at Massachusetts Institute of Technology. After graduation, he instructed at MIT for one year, then became consultant to the Connecticut Aircraft Company. In 1916 he joined Glenn L. Martin as Chief Engineer.

He was chief civilian aeronautical engineer for the U. S. Signal Corps in World War I, and later designed the first Martin bomber—an airplane which broadened the concept of military power. At the age of 28, with $600.00 he started his own airplane building venture in California. His first attempt on his own was a two-place, wooden bi-plane called the "Cloudster," which he built for a sportsman who wanted to fly across the continent.

In 1936 he was awarded the Collier Trophy by President Roosevelt for the numerous technical advancements in the DC-3 (later C-47), which established entirely new horizons for aviation transport-type aircraft. In 1948 he received a Certificate of Merit from the federal government for producing one-sixth (by weight) of all aircraft manufactured in the United States during World War II. He possesses several other honors and commendations.

Requirements for Articles

Because it is the voice of THE AIR FORCE HISTORICAL FOUNDATION, *The Air Power Historian* is interested in articles dealing with any historical aspect of the evolution of air forces, the people, the aircraft, and especially the ideas and ideals which helped bring this about. *The Air Power Historian's* manner of making a contribution to American periodical literature is to stress human interest and to document in readable fashion those events and developments not found in the official historical studies or in the public consciousness.

We are in need of articles approximately 3500 to 5000 words. Pertinent illustrations as well as pictures of authors and biographical sketches should accompany manuscripts submitted for consideration by the Editorial Board. A modest honorarium of $50.00 to $100.00 can be offered for lead articles which are accepted. In some cases an Honorary Life Membership in The Foundation may be had in lieu of the honorarium. Prospective authors may submit manuscripts to: The Editor, *The Air Power Historian*, Building 830, Maxwell Air Force Base, Alabama.

Bibliographic Assistance

The Air Power Historian is indebted for the wonderful assistance on gathering the quarterly bibliographies on books and articles to Miss Florine A. Oltman, Chief of the Bibliographic Assistance Branch of the Air University Library, Maxwell AFB, Alabama. The majority of each of the columns on books and articles which appear in our magazine are furnished to us by Miss Oltman.

LETTERS TO EDITOR . . .

Dear General:

Thank you for the pleasant reminder that my annual contribution for membership is past due. Inclosed is my check to cover that fee. Thanks, also, for forwarding my copy of the *Historian* to me here at Mitchel AFB.

I regret that I needed reminding and that I can't afford more than just an annual membership at this time.

If it were only because of your superior publication—which certainly is not the case—your Foundation would be of inestimable value to me. I honestly can say there is no other periodical that I would miss receiving more.

Your article on reorganization was of particular interest. Its impact was enhanced because of when it was written. The time that has passed only serves to underscore the incisiveness of your analysis.

Thanks for the kind words about my newly started tour here at Mitchel AFB.

Sincerely,
DONALD M. BELL
Captain, USAF
Mitchell AFB, New York

Dear Sir:

In your October 16th letter which acknowledged receipt of my annual dues you requested my comments. There are two I would like to make.

1. Your letters are always so friendly in tone and sound so interested that they are a genuine pleasure to receive, even the ones that say it is dues time again.

2. I have been very impressed with the improvements in each issue of the publication. It is a very interesting publication with many very fine elements of Air Force history coming to light in each issue.

Now that I am assigned to duty with an Air Force ROTC Detachment, I bring all of my copies of the magazine to our cadet lounge where our cadets can read and enjoy them and profit by their contents. These cadets are very much interested in anything which has to do with airplanes and flying, therefore, I think that your publication serves as a real fine tool for motivation.

Sincerely,
BILLY W. BAKER
Captain, USAF
Michigan State University
East Lansing, Michigan

Dear General:

. . . I have found *The Air Power Historian* the most interesting of any air journals. Of course the answer is that its editorial policy is what would appeal to a historian. Long years ago I was in touch with Edgar Gorrell about the old World War I Air Corps history. He would have been pleased with your journal, and I am happy to see some of his work being published, giving him some recognition for his work in the early days.

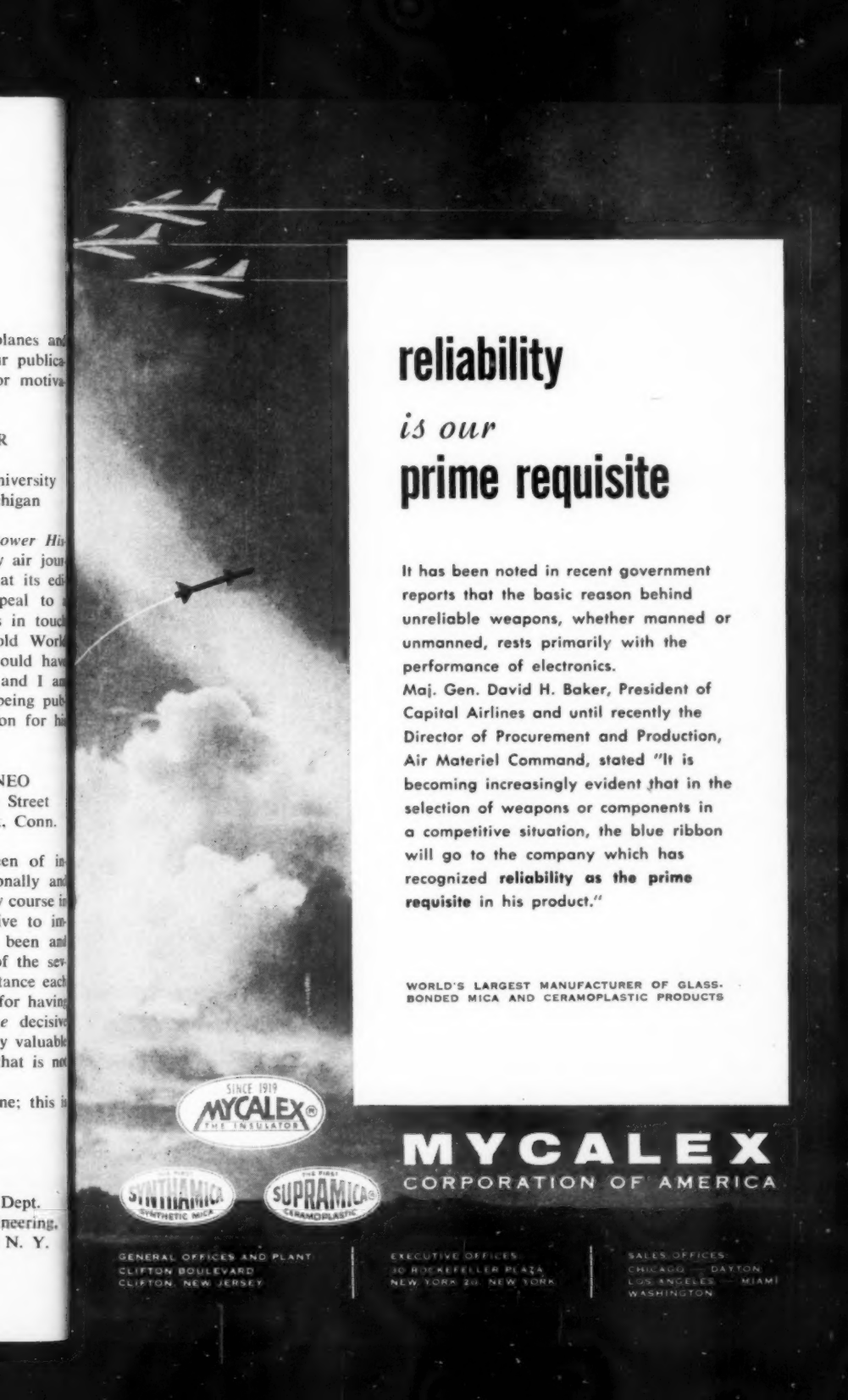
Sincerely,
JOHN R. CUNEO
91 Washington Street
South Norwalk, Conn.

Dear General:

. . . Your publication has been of inestimable help to me both personally and in the conduct of my work. In my course in the history of military art I strive to impress the cadets that wars have been and will be won by the joint effort of the several Services, and that in each instance each Service could make a good case for having been *a* decisive force if not *the* decisive force. I frequently find some very valuable information in your publication that is not otherwise available.

The magazine is a very fine one; this is the only comment I have.

Sincerely yours,
V. J. ESPOSITO
Colonel, USA
Professor and Head of Dept.
Military Art and Engineering,
USMA, West Point, N. Y.


reliability
is our
prime requisite
It has been noted in recent government reports that the basic reason behind unreliable weapons, whether manned or unmanned, rests primarily with the performance of electronics.
Maj. Gen. David H. Baker, President of Capital Airlines and until recently the Director of Procurement and Production, Air Materiel Command, stated "It is becoming increasingly evident that in the selection of weapons or components in a competitive situation, the blue ribbon will go to the company which has recognized reliability as the prime requisite in his product."
WORLD'S LARGEST MANUFACTURER OF GLASS-BONDED MICA AND CERAMOPLASTIC PRODUCTS
SINCE 1919
MYCALEX
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CORPORATION OF AMERICA
GENERAL OFFICES AND PLANT
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CLIFTON, NEW JERSEY
EXECUTIVE OFFICES
30 ROCKEFELLER PLAZA
NEW YORK 20, NEW YORK
SALES OFFICES
CHICAGO — DAYTON
LOS ANGELES — MIAMI
WASHINGTON

CONVAIR'S B-58 HUSTLER and CONVAIR'S ATLAS ICBM

PARTNERS FOR PEACE... manned and unmanned

Long range planning of yesterday by the U. S. Air Force is taking shape today in *manned and unmanned* weapons systems such as Convair's B-58 Hustler—our *first supersonic bomber;* and Convair's Atlas—*free world's first Intercontinental Ballistic Missile!* In utilizing the outstanding features of both systems this unmatched combination offers the Air Force maximum flexibility in carrying out its Strategic Missile These *partners for peace,* both *manned and unmanned,* integrated into a single instrument of defense, p a vital role in keeping the free world free!

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION